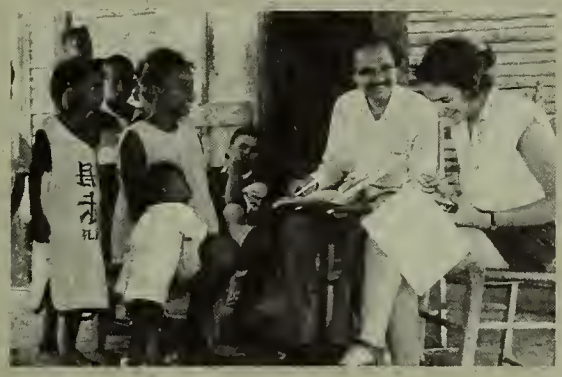
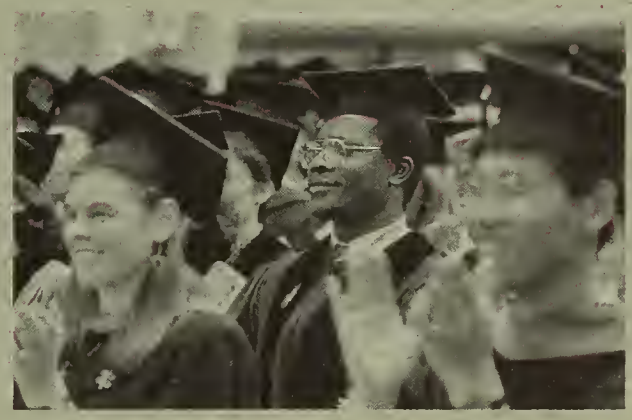


Harvard School of Public Health



Official Register
of Harvard University
1993-1994

Volume 15, Number 9
September 5, 1993

Every effort is made to ensure the information contained in this Register is accurate at the time of publication. However, the School of Public Health reserves the right to make changes without notice in tuition and fees, admissions and degree requirements, courses of instruction, and other information contained herein. These changes will govern all students, including students who matriculated prior to the changes coming into effect.

As a matter of policy, law, and commitment, the School of Public Health does not discriminate against any person on the basis of race, color, sex, sexual orientation, religion, age, national or ethnic origin, political beliefs, veteran status, or handicap in admissions to, access to, treatment in, or employment in its programs and activities. The following person has been designated to handle inquiries regarding the nondiscrimination programs: Carolyn Everette, Director of Human Resources, 677 Huntington Avenue, Boston, MA 02115, telephone 617/432-1046. In addition, inquiries about the application of nondiscrimination policies regarding race, color, national origin, age, sex, or handicap may be referred to the Regional Director, Office for Civil Rights, US Department of Education, J.W. McCormack POCH, Room 222, Post Office Square, Boston, MA 02109.

Chapter 151c, Section 2B, of the General Laws of Massachusetts
Any student in an educational or vocational training institution, other than a religious or denominational educational or vocational training institution, who is unable, because of his religious beliefs, to attend classes or to participate in any examination, study, or work requirement on a particular day shall be excused from any such examination or study or work requirement which he may have missed because of such absence on any particular day; provided, however, that such makeup examination or work shall not create an unreasonable burden upon the school. No fees of any kind shall be charged by the institution for making available to the said student such opportunity. No adverse or prejudicial effects shall result to any student because of his availing himself of the provisions of this section.

The Harvard School of Public Health is accredited by the Council on Education for Public Health.

Photo Credits: Richard A. Chase, Paula Lerner, and Michael Lutch

Postman will not deliver if correct Postage is not affixed here.

Student Affairs Office
Harvard School of Public Health
677 Huntington Avenue
Boston, MA 02115

ATTN: Carol O'Connell

Please send me the following:

- ❑ An application for and information about the Shattuck International House.
- ❑ Information on alternative housing options.

Thank you.

Please print legibly or type:

Name: _____

Mailing Address: _____

_____

_____

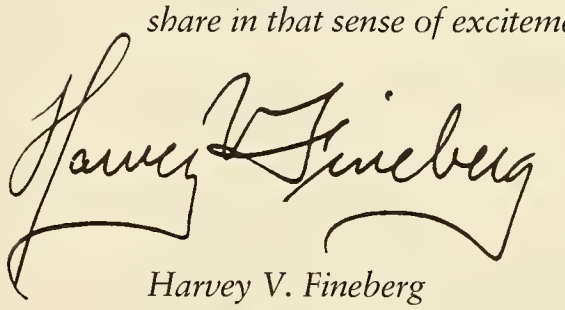
_____

A Note From the Dean

Public health is concerned with preserving and enhancing the health of populations. The scope of public health is extensive, as reflected in the range of courses, departments, centers, programs, and facilities described in this Register. The interests and expertise of faculty at the school are similarly diverse, extending across biological sciences, social sciences, numeric disciplines, and more.

The Register contains a wealth of information about educational opportunities at the Harvard School of Public Health. Though we have endeavored to make it accurate and comprehensive, it is necessarily an incomplete description of the learning experience available at the school. The School of Public Health is a place to acquire new skills; a place to enrich one's professional perspective by interacting with fellow students as well as with faculty; a place to gain a more sophisticated understanding of health sciences, health issues, and problems and their possible solutions; a place to test one's ideals, objectives, and imagination against the imposing array of biological, individual, organizational, economic, and political barriers to improved public health.

The principal educational mission of the school is to prepare leaders in professional service and the sciences aimed at promoting the health of populations. We believe we are engaged in a vital enterprise of central importance to society. We welcome those who join us at the school to share in that sense of excitement and challenge.



Harvey V. Fineberg
Dean

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Calendar for the Academic Year 1993-1994

Advance Seminar-Fall 1993

Tuesday, September 7 through Friday, September 17

The Advance Seminar Program presents an opportunity for all international students and new Master of Public Health (MPH) students to orient themselves to the Harvard School of Public Health and to Boston. It provides a brief, intensive introduction to the academic aspects of study at the school, including beginning and intermediate computing, exercises in the discussion method of classroom learning, and a review of mathematical and writing skills.

Program participants learn about classroom protocol, expectations of teacher and student, and student life at the school. They have the chance to become familiar with, and settled in, the Boston area, and to become acquainted with fellow students in workshops and social gatherings.

The program is particularly valuable for those students who have not attended US colleges or universities and for those who have not recently been students. All international students are strongly advised to attend; US students entering the MPH Program are welcome and encouraged to attend. There is no additional charge for this program.

Registration and Orientation–Fall 1993

September

7 - 17, Tuesday-Friday	*Advance Seminar Program for MPH and new international students*
13, Monday	*Registration for new students* *9:30 a.m. - 10:30 a.m. (Last name beginning with A - D)* *10:30 a.m. - 11:30 a.m. (Last name beginning with E - J)* *11:30 a.m. - 12:30 p.m. (Last name beginning with K - N)* *12:30 p.m. - 1:30 p.m. (Last name beginning with O - R)* *1:30 p.m. - 2:30 p.m. (Last name beginning with S - V)* *2:30 p.m. - 3:30 p.m. (Last name beginning with W - Z)*
14, Tuesday	*Registration for all returning students* *9:30 a.m. - 10:30 a.m. (Last name beginning with A - D)* *10:30 a.m. - 11:30 a.m. (Last name beginning with E - J)* *11:30 a.m. - 12:30 p.m. (Last name beginning with K - N)* *12:30 p.m. - 1:30 p.m. (Last name beginning with O - R)* *1:30 p.m. - 2:30 p.m. (Last name beginning with S - V)* *2:30 p.m. - 3:30 p.m. (Last name beginning with W - Z)*
13 - 17, Monday-Friday	*Faculty advisers available to meet with students*
13 - 17, Monday-Friday	*Orientation programs/ departmental meetings*
16, Thursday	*Last day to pick up registration materials without late fee for fall semester*
20, Monday	*Last day to submit registration form to Registrar's Office without late fee*
24, Friday	*Last day to pick up registration materials with late fee for fall semester*
27, Monday	*Last day to submit registration form to Registrar's Office with late fee*

Fall Semester 1993

September

20, Monday	*"a" and "ab" period courses begin*

Please note that "a" period courses meeting on Mondays and Wednesdays may have scheduled meetings on Fridays due to the holidays occurring in "a" period. Please check HSPH course schedule for details.

20, Monday	*Deadline for application for November degree*

October

8, Friday	*Drop/add/change deadline for "a" and "ab" period courses* *Cross-registration deadline for "a" and "ab" period courses* *TAP/affiliate/alumni registration deadline for "a" and "ab" period courses*
11, Monday	*Columbus Day, a holiday*
15 , Friday	*Deadline for submission of theses for November degree*

November

11, Thursday	*Veterans' Day, a holiday*
12 , Friday	*"a" period courses end*
15 , Monday	*"b" period courses begin*
25 - 28, Thursday-Sunday	*Thanksgiving recess*

December

3, Friday	*Drop/add/change deadline for "b" period courses* *Cross-registration deadline for "b" period courses* *TAP/affiliate/alumni registration deadline for "b" period courses*
18, Saturday-January 2, Sunday	*Winter recess*

January

3, Monday	*Deadline for application for March degree*
17, Monday	*Martin Luther KIng, Jr. Day, a holiday*
21, Friday	*"ab" and "b" period courses end*
24, Monday	*Drop/add/change deadline for "e" period courses* *Cross-registration deadline for "e" period courses* *TAP/affiliate/alumni registration deadline for "e" period courses*
24 - 28, Monday-Friday	*"e" period, inclusive*

Spring Semester 1994

January

21, Friday	*Last day to pick up registration materials without late fee for spring semester*
	Last day to submit registration forms to Registrar's Office without late fee for spring semester
31, Monday	*"c" and "cd" period courses begin*

February

4, Friday	*Last day to pick up registration materials with late fee for spring semester*
	Last day to submit registration forms to Registrar's Office with late fee for spring semester
14, Monday	*Deadline for submission of theses for March degree*
18, Friday	*Drop/add/change deadline for "c" and "cd" period courses*
	Cross-registration deadline for "c" and "cd" period courses
	TAP/affiliate/alumni registration deadline for "c" and "cd" period courses
21, Monday	*President's Day, a holiday*

March

7, Monday	*Deadline for application for June degree*
25, Friday	*"c" period courses end*
28, Saturday - April 3, Sunday	*Spring recess*
28, Monday	*Drop/add/change deadline for "f" period*
	Cross-registration deadline for "f" period courses
	TAP/affiliate/alumni registration deadline for "f" period courses
28, Monday- April 1, Friday	*"f" period, inclusive*

April

4, Monday	*"d" period courses begin*
22, Friday	*Drop/add/change deadline for "d" period courses*
	Cross-registration deadline for "d" period courses
	TAP/affiliate/alumni registration deadline for "d" period courses

May

20, Friday	*Deadline for submission of theses for June degree*
27, Friday	*"cd" and "d" period courses end*
30, Monday	*Memorial Day, a holiday*
31, Tuesday - June 8, Wednesday	*Postclass period*

June

9, Thursday	*Commencement 1994*

1993–1994 Degree Calendar

For a diploma or a degree to be awarded in:	Degree applications are due in the Registrar's Office on:	Theses are due in the Registrar's Office on:
November 1993	September 20, 1993	October 15, 1993
March 1994	January 3, 1994	February 14, 1994
June 1994	March 7, 1994	May 20, 1994

Note: ALL degree candidates (SM, MPH, SD, and DPH) expecting to graduate must file a degree application according to the dates outlined above. If deadlines are missed, students may apply for degree to be conferred on a later date.

Summary of 1993–1994 Drop/Add/Change Deadlines

Fall 1993

October 8, Friday	*Drop/add/change deadline for "a" and "ab" period courses*
	Cross-registration deadline for "a" and "ab" period courses
	TAP/affiliate/alumni registration deadline for "a" and "ab" period courses
December 3, Friday	*Drop/add/change deadline for "b" period courses*
	Cross-registration deadline for "b" period courses
	TAP/affiliate/alumni registration deadline for "b" period courses
January 24, Monday	*Drop/add/change deadline for "e" period courses*
	Cross-registration deadline for "e" period courses
	TAP/affiliate/alumni registration deadline for "e" period courses

Spring 1993

February 18, Friday	*Drop/add/change deadline for "c" and "cd" period courses*
	Cross-registration deadline for "c" and "cd" period courses
	TAP/affiliate/alumni registration deadline for "c" and "cd" period courses
March 28, Monday	*Drop/add/change deadline for "f" period courses*
	Cross-registration deadline for "f" period courses
	TAP/affiliate/alumni registration deadline for "f" period courses
April 22, Friday	*Drop/add/change deadline for "d" period courses*
	Cross-registration deadline for "d" period courses
	TAP/affiliate/alumni registration deadline for "d" period courses

The Harvard School of Public Health

The Challenge

Public health seeks to preserve and enhance the health of populations, attacking problems of global scope and complexity. The field is characterized by a focus on the prevention of disease and injury, by an interdisciplinary approach that brings together experts with a broad range of interests, and by an emphasis on the solution of real-world problems. Public health approaches have produced dramatic gains in the health of Americans in this century — 28 added years of life expectancy, marked declines in infant mortality, control of many childhood infections, and since the late 1960s, striking reductions in heart disease. To prevent disease and injury in the United States and around the world, public health professionals use a broad strategy that embraces the way we live, our environment, and our system of health care.

In preserving and enhancing health, what distinguishes public health from medicine? In general, as a physician aims to maintain the health of an individual, primarily through the diagnosis and treatment of disease, the goal of the public health professional is to understand and meet the health needs of communities, groups, and nations. Where medicine follows a personal service ethic, conditioned by an awareness of social responsibilities, public health is governed by an ethic of public service, tempered by concern for the individual. Unlike medicine, a well-established profession with a sharp public image, public health has multiple professional identities and a more diffuse image.

The Harvard School of Public Health (HSPH) includes over 200 faculty members—biostatisticians and epidemiologists, health administrators and educators, nutritional biochemists and cancer biologists, specialists in environmental and occupational health, experts in behavioral and population sciences and many others. Together, they are working to overcome the public health challenges of today: chemical and other hazards in the environment, the threat of new diseases, choices of lifestyle that rob millions of many healthy years, inadequate access to health care and other necessities of life, and the great parasitic diseases that kill and handicap millions around the globe.

Our Mission

The overriding mission of the Harvard School of Public Health, to advance the public's health through learning and discovery, comprises a set of four objectives: First, to educate scientists, professionals, and leaders for public health; second, to foster new discoveries and develop better technologies for improved health of individuals and populations; third, to inform and constructively influence debate on key public health issues; and fourth, to strengthen capacities and services that meet health needs in the community. Research at the school proceeds within five comprehensive, cross-cutting themes, whose objectives are as follows:

• **AIDS, cancer, and heart disease: Confront the most urgent and important diseases of our time, with an emphasis on prevention.** To these health problems the school brings the tools of population-level analysis (epidemiology and biostatistics) combined with related and selective exploration of biologic mechanisms (increasingly at the molecular level), social science aspects, and analysis of policy options.

• **Health care: Assess needs and performance, and create instruments of reform to contain costs, assure quality, and achieve greater equity in health care.** Faculty working on issues of health care reform have expertise in political analysis, economics and finance, decision science, technology assessment, cost-effectiveness analysis, health management, and law and ethics.

• **The environment: Analyze risks and devise strategies for a healthier environment, a safer workplace, and fewer injuries.** Scientists and analysts at the school measure human exposure to environmental hazards, evaluate resulting health effects, including the biological mechanisms of damage, and assess the measurement, management, and control of risk.

• **Behavior, nutrition, and lifestyle: Educate and empower each individual to make healthier choices at every stage of life.** Focusing on alcohol and drug abuse, smoking, unsafe sex, violence, highway accidents, and aspects of diet, the school seeks to discover social and behavioral factors that challenge the health of populations, then to design and test effective change strategies.

• **World health: Build human and technical capacity in developing societies and apply new science to longstanding problems.** The school works toward the solution of health problems in developing countries by training leaders who can confront these problems, by applying available low-cost yet effective technologies, by developing new vaccines and other interventions, and by strengthening policy research, economic analysis, and management. The school serves as a crossroads for international health, attracting health policymakers and public health professionals from dozens of countries.

The History of HSPH

The gradual organization of professional education in public health at Harvard University was characterized by certain important steps. The first occurred in 1909 with the establishment of the Department of Preventive Medicine and Hygiene in the Medical School — the first such department in the United States. The first Doctor of Public Health degree was conferred in 1911, the same year the Department of Sanitary Engineering was established in the Graduate School of Engineering. In 1913, the Department of Tropical Public Medicine was organized in the Medical School, followed in 1918 by the Division of Industrial Hygiene.

Also in 1913, the Harvard-MIT School of Health Officers was formed under the joint management of Harvard University and the Massachusetts Institute of Technology (MIT). The School of Health Officers operated until the fall of 1922, when it was superseded by the Harvard School of Public Health, made possible by an endowment from the Rockefeller Foundation.

During the early years of the school's operation, several of its departments functioned jointly with counterparts in the Medical School, sharing facilities, faculty, and budgets. In 1946, the school was administratively and financially separated from the Medical School and became an autonomous unit of Harvard University. It continues to cooperate with the Medical School in teaching and research, and has developed close associations with other divisions of the university, particularly the Graduate School of Arts and Sciences, the John F. Kennedy School of Government, and the Graduate School of Business Administration. The school also maintains a close association with a wide variety of health, medical care, and welfare organizations and agencies in Massachusetts and elsewhere.

Resources

Location The school's main buildings for research, teaching, and administration are located in the heart of Boston's hospital district and Harvard University's Longwood campus. The facilities adjoin those of Harvard's Medical School, School of Dental Medicine, and Francis A. Countway Library of Medicine, and are near Children's Hospital Medical Center, Beth Israel Hospital, Brigham and Women's Hospital, and other Harvard-affiliated hospitals. The school is also within walking distance of Boston's Museum of Fine Arts and the Isabella Stewart Gardner Museum, as well as Northeastern University and other colleges. Public transportation is readily available to other parts of Boston, and a shuttle bus runs frequently between the Longwood and Cambridge campuses, via MIT.

Cross-Registration Students at HSPH may enroll in courses offered by all other Harvard graduate schools, such as the Medical School, the Graduate School of Arts and Sciences, the Graduate School of Education, the John F. Kennedy School of Government, and the Graduate School of Business Administration. Students may cross-register at the Massachusetts Institute of Technology, and at the Fletcher School of Law and Diplomacy at Tufts University as well. Students may not cross-register for more than half their credits per semester in other schools without first gaining approval by petitioning the HSPH Committee on Admissions and Degrees.

Credit is generally granted toward an HSPH degree for cross-registered courses if a course is offered for graduate credit and if the course is relevant to a degree in public health. By signing the cross-registration petition, a student's advisor demonstrates his or her concurrence that the course is relevant to a degree in public health. Courses in foreign languages and other undergraduate-level courses will not count toward the public health degree and will not appear on the HSPH transcript.

To cross-register, an HSPH student must obtain a cross-registration petition from the HSPH Registrar's Office for each school into which he/she is cross-registering, complete the form, obtain the signatures from the instructor of the course and the HSPH advisor, and **submit the form to the registrar at the school into which the student is cross-registering.** In addition to completing the cross-registration form, the HSPH student must list courses for which he/she is cross-registering on the HSPH registration form.

Deadlines for cross-registering vary among schools. Cross-registering students must meet the earliest cross-registration deadline set by either the school into which cross-registration is taking place or the deadline set by HSPH.

Information about converting credit from other schools to the HSPH equivalent credit is listed on the back of the HSPH cross-registration petition. Some schools restrict the grading option students may choose to pass-fail grade only or ordinal grade only. The grade received from the school is the grade that will appear on the HSPH transcript. For example, the Harvard Business School reports grades by using Roman numerals. HSPH will not convert these grades to letter grades or pass/fail grades and a Roman numeral will appear on the transcript.

Courses taken through Harvard Summer School and Harvard Extension School are not available through cross-registration. If a student wishes to take courses through the Summer or Extension schools, additional tuition payment is required to those schools, and the credit received will not appear on the HSPH transcript. Students who wish to take courses in English as a Second Language at Harvard's Division of Continuing Education must pay an additional tuition fee for the twelve-week session.

For more information on cross-registration, contact the HSPH Registrar's Office at 617/432-1032.

Libraries The library needs of the school are served principally by the Francis A. Countway Library of Medicine. The Countway combines the resources and services of the Harvard Medical Library and the Boston Medical Library, making it the largest medical or health-related library in the country. Its recorded holdings include more than 545,000 volumes and 4,000 periodicals. The Countway also owns an extensive collection of historical materials dating from the fifteenth century. Its Rare Books Department provides modern facilities for the use of these books and other rarities.

Students have borrowing privileges throughout the Harvard University library system. Messenger service is provided daily between Harvard's libraries and the Countway Library. Some departments within the school also maintain libraries. The Boston Public Library, MIT libraries, and other libraries in the Boston area add to the total book and periodical resources available to students.

Child Care Facilities There are a number of child care facilities on the Longwood and Cambridge campuses. They are quickly filled, so arrangements should be made as early as possible. For further information, contact the Office of the Child Care Advisor at 617/495-2851. The Medical Center Office for Parenting at 617/432-1615 can also provide information on support services, resources, and programs.

Instructional Computing Facility The School of Public Health operates an Instructional Computing Facility (ICF) dedicated to serving the course work and dissertation computing needs of the students and faculty. ICF provides free computing and data processing resources on a variety of systems. These resources include SUN Unix computers, IBM and compatible personal computers, APPLE Macintosh computers, a Novell network, and dot matrix and laser printers. A wide array of software is available, including statistical packages, programming languages, analytical programs, and word-processing packages. ICF also provides remote dial-in, file transfer, electronic mail, and connections to national and international networks, such as BITNET and INTERNET. In addition, computer accounts for funded research projects are available at a reasonable cost.

The facility is open daily during the academic year. User assistance is provided by the ICF staff and by the teaching assistants from courses which have computing assignments. Telephone support, walk-in consultations, documentation, and short courses are also offered throughout the year. Many individual departments in the school also provide computing resources for their students. Harvard's central computing organization, the Office for Information Technology (OIT), offers members of the university many additional services (some for a fee), such as classes on various computer topics, discounted hardware and software purchases, user groups, and technical support.

Health Promotion Task Force

A health promotion task force was established by the Dean to identify ways that the Harvard School of Public Health could improve the health of its own population—students, faculty, and staff. Some of the recommendations of this task force include implementation of the school's no-smoking policy and the establishment of the Center for Health Promotion. The center, within the Department of Health and Social Behavior, coordinates worksite health promotional activities and encourages faculty members involved in health promotional research to commit resources and efforts to make the school an exemplary workplace for students, faculty, and staff. Health education, nutrition awareness, exercise promotion, and the establishment of a drug-free workplace have been some of the actions to date.

The Student Body

The student body includes over 650 full- and part-time students from throughout the United States and from over 50 countries. In the 1992-93 academic year, women were in the majority, with 353 registered for degree programs. Twelve percent of the students identified themselves as members of minority groups. In terms of occupational backgrounds, students come from an array of fields, and include health services administrators, epidemiologists, nurses, dentists, lawyers, statisticians, environmental scientists, engineers, research assistants, psychologists, and social workers. Approximately 30 percent are physicians. Also enrolled are students with bachelor's degrees and little professional experience in public health.

Minority Students Members of minority groups at the school have joined to form the HSPH Minority Student Health Organization. This group meets throughout the academic year. Its activities include arranging for speakers, planning special symposia, and panel discussions on public health issues concerning underserved populations.

The Third World Caucus (TWC) implements programs and addresses issues that have an impact upon minority students at Harvard's Medical School, School of Dental Medicine, and School of Public Health. It comprises four student health organizations on the Longwood campus: Black Health Organization, Boricua Health Organization, National Chicano Health Organization, and Native American Health Organization.

Each fall, the school sponsors a reception to introduce minority students to minority alumni/ae from the Boston area.

The school is committed to increasing the number of students from underrepresented groups as well as to expanding the diversity of the faculty and staff. It recognizes the urgent need for increased participation by underrepresented professionals and the impact of this participation on the future of health care systems worldwide.

International Students Many of the students at the Harvard School of Public Health come from outside the United States. The experience they bring with them lends an important dimension to the international health components of the school's academic programs and adds to the diversity of the student population.

Students from abroad are invited to participate in the Host Family Program, administered by the Harvard International Office. This program provides students with the opportunity to get to know an American family who will welcome them and ease their transition to the American way of life.

The Harvard International Office also operates a furniture exchange during the summer and fall to provide low-cost secondhand furniture to students and scholars newly arriving from abroad.

For more information about either the Host Family Program or the furniture exchange, contact the Harvard International Office, 1350 Massachusetts Avenue, Cambridge, MA 02138 (telephone 617/495-3349).

The Office for Students sponsors a Student Host Program for international students. Continuing HSPH students are paired with incoming international students to assist in facilitating a successful transition to HSPH and to Harvard University. For further information about this program, please refer to the following section on the Office for Students.

The Office for Students

The HSPH Office for Students provides support services and offers educational, social, and cultural programs that enhance the academic experience, facilitate student development, and encourage interaction among students. The office serves students who are diverse in age, experience, and cultural background by helping them understand and better deal with the various aspects of their academic and personal lives. Some of the services the office provides are the following: recruiting students and postdoctoral fellows, investigating sources of student financial aid, counseling prospective and current students, maintaining liaisons with student groups, addressing special needs and concerns of students, and providing career counseling. The Office for Students also pursues student disciplinary issues and responds to complaints of sexual harassment.

Staff in the Office for Students adhere to a philosophy of continuous improvement in their efforts to help students achieve their greatest potential as individuals and as members of the public health profession. In fulfilling its mission, the Office for Students reaches out to current and graduating students through the functions of the following offices:

Student Affairs Office The Student Affairs Office provides a range of services to students. These services include counseling; international student programming; tutoring; assisting students seeking housing; overseeing the student lounge, lockers, and mailboxes; scheduling classrooms; administering short-term emergency loans; planning orientation and commencement; developing special programs; and serving as the liaison to persons with disabilities, to the Student Coordinating Committee, the Minority Student Health Organization, and the International Student Host Program. The Student Affairs Office also oversees the Henry Lee Shattuck International House, an apartment residence operated by the school.

Career Services Office The Career Services Office provides career counseling, programming, resources, and networking opportunities for students and alumni/ae. These complement the efforts of departments, programs, and faculty advisors. The manager of Career Services helps students and alumni/ae to assess skills and goals, explore career options, investigate career resources, write resumes and cover letters, develop interviewing skills, and apply for Fulbright and traveling fellowships. She con-

ducts numerous workshops covering various aspects of the job search, invites outside speakers to share information about public health career paths and opportunities, and sponsors a special series of professional development workshops/seminars such as "Communication Skills for the Public Health Professional."

The Career Services Office sponsors an annual Career Day which draws potential employers representing private and nonprofit institutions, international organizations, and governmental agencies. This event gives students the opportunity to learn about careers and internships from a wide range of public health organizations, to develop contacts, and to submit resumes.

In the Career Resource Center, students have access to listings of current job openings, information about fellowships and internships, career-related opportunities, and files on numerous health care organizations. The monthly *Job Opportunities Bulletin* is available to students and alumni/ae. A growing data bank of alumni/ae career advisors has also been established.

For more information about the Career Services Office contact Ms. Andrea Wolf, Manager of Career Services, HSPH, 677 Huntington Avenue, Boston, MA 02115, or call 617/432-1034.

Housing The Henry Lee Shattuck International House is an apartment residence operated by the school on a nonprofit basis for its full-time students and their families from the United States and abroad. Located within walking distance of the school, Shattuck House consists of 72 apartments, each with a kitchenette and bath. There are four different size apartments: studio, one bedroom, two bedroom and shared units. All apartments are furnished with basic items except for linens, blankets, and kitchen utensils; no unfurnished units are available. Facilities include a laundry room, study room, computer room, and a recreational area for adult residents as well as indoor and outdoor play areas for children. There are four floors and no elevator.

Since the demand far exceeds the number of apartments available, applications for Shattuck House should be submitted as soon as possible, even before the applicant is accepted to the school. (If the applicant is denied admission to the school, the housing application is withdrawn.) To receive priority consideration for an apartment, applicants should submit an application by May 1. However, applications received after that date will still be considered until all units are occupied.

Seventy percent of the available apartments will be assigned to new and returning international students and thirty percent to new and returning US and Canadian students. Distance and date of receipt of application will be the determining factors. Please note that although applicants may apply for an apartment before they have been admitted, an assignment is not be made until acceptance by the Admissions Office. International students are permitted to live in the house a maximum of three years and US and Canadian students a maximum of two years, provided they continue to be full-time students.

The Student Affairs Office maintains a bulletin board on which listings for housing available and housing wanted are maintained. These listings must be viewed in person; information is not given out by mail or telephone. Informational fact sheets about seeking and renting apartments have been prepared and are available upon request.

For application forms and more detailed information, contact Mrs. Carol O'Connell, Harvard School of Public Health, Student Affairs Office, 677 Huntington Avenue, Boston, MA 02115, or call 617/432-1034. Mrs. O'Connell is available to meet with applicants regarding Shattuck International House and alternative housing, and to assist applicants with housing problems.

For More Information Students interested in the services provided by the Student Affairs Office should contact the office at 677 Huntington Avenue, Boston, MA 02115, or call 617/432-1034. Dr. Cassandra Simmons, Assistant Dean for Students, may be contacted at 617/432-1036.

Alumni/ae Association

The Alumni/ae Association of the Harvard School of Public Health enjoys an active membership of over 6,000 graduates worldwide. The association is governed by a council of twelve members, which meets twice each spring and again during the fall meeting of the American Public Health Association (APHA). Alumni/ae also meet regionally in major cities in this country and abroad. These smaller gatherings are organized by members of the association and the council with assistance from the school. Alumni/ae receptions have been held in Boston, Chicago, San Francisco, New York City, Washington, DC, and abroad in Scandinavia, Japan, Taiwan, Germany, and the Netherlands.

In 1981, the Alumni/ae Association was instrumental in establishing the Annual Fund for Student Assistance to help provide tuition scholarships, travel grants, and funding for other student needs.

Members of the Alumni/ae Association have also formed a network for the purpose of providing information to potential applicants to the school. A list of contacts can be found in the admissions packet.

Twice a year, the school publishes the *Harvard Public Health Review*, the official publication of the Alumni/ae Association. The *Review* reports on the diverse activities of alumni/ae in many countries and features articles and class news contributed by graduates.

For More Information Please contact Ms. Sheila A. Kiernan, Director, Annual Fund and Alumni/ae Relations, HSPH, 677 Huntington Avenue, Boston, MA 02115, or call 617/432-0939.

Degree Requirements

The Harvard School of Public Health offers programs leading to the graduate degrees of Master of Public Health (MPH), Doctor of Public Health (DPH), Master of Occupational Health (MOH), Master of Science (SM) in a public health discipline, and Doctor of Science (SD) in a public health discipline.

In general, the master's degrees are viewed as terminal degrees for individuals who seek professional positions in public health. In a few departments, however, the SM is intended as preparation for doctoral study. The doctoral programs are designed for students with interests in the scientific basis of public health and preventive medicine who wish to pursue academic or research careers. When completing the admissions essay, applicants to doctoral programs should specify their future research interests in the discipline they wish to pursue at the school and/or their interest in an academic career.

Background of Applicants For all programs, the school's Committee on Admissions and Degrees considers applicants' academic ability, the relevance of their previous education and experience, and their overall qualifications for graduate professional education in public health, including those qualities of character which reflect upon an individual's suitability to be a public health professional. Applicants must also satisfy the requirements of the department or program to which they are applying, and show that their background is appropriate. Applicants to doctoral programs must demonstrate the ability to undertake original research, and are encouraged to contact the department of their interest for more information.

Most courses at the school require students to write papers, reports, and take examinations; doctoral students must also complete a dissertation. All programs require courses in quantitative areas. Students who are not confident of their writing and/or math ability are advised to brush up on these skills, taking refresher courses if necessary, before coming to the school.

Students are normally required to submit written assignments in typed, rather than handwritten, form. Since it is expensive to hire a typist, it is useful for prospective students to have gained some typing skills before entering the school. It is also helpful for entering students to be familiar with basic wordprocessing and spreadsheet software such as WordPerfect and Lotus 1-2-3.

For More Information Because specific prerequisites and degree requirements vary with the discipline or field of specialization, prospective applicants should consult the sections of this book which describe departmental and interdisciplinary degree programs. All applicants are required to submit official scores from the Graduate Record Examination (GRE) even if the applicant has an earned graduate degree; details about this requirement and other information about admissions procedures can be found in the section *Admission, Registration, Financial Assistance.* For any questions not answered in this Register, please write to the department or program of interest or to Ms. Dolita Cathcart, Assistant Director of Admissions, Admissions Office, HSPH, 677 Huntington Avenue, Boston, MA 02115, or call 617/432-1031.

Master of Science

Master of Science (SM) degree programs differ considerably from department to department, both in their overall goals and in their specific admission and degree requirements. An applicant may be admitted to an SM degree program in more than one discipline, if the applicant meets the requirements of both departments involved. In this case, the degree conferred specifies both fields. An applicant may be admitted to either a one-year or a two-year program, as described in this section.

Background of Applicants An applicant with a bachelor's degree is normally considered for admission to a two-year degree program. A year or more of appropriate graduate work occasionally enables a student to fulfill the requirements of certain two-year programs in one or one-and-a-half years.

Students in the one-year SM degree program generally hold doctoral degrees in medicine, dentistry, veterinary medicine, or in another field relevant to the department(s) to which admission is sought.

Applicants holding master's degrees may be considered for admission to one-year or two-year degree programs, depending upon their educational and professional background and the particular requirements of the program to which they wish to apply.

Requirements for the Degree Students enrolled in a one-year program must successfully complete at least 40 credits, and those in a two-year degree program, 80 credits. Unless they can demonstrate equivalent preparation, candidates for the SM degree must fulfill basic requirements in biostatistics and epidemiology, as follows:

1. BIO 200ab, *Introduction to Statistical Methods* (5 credits) or BIO 201ab, *Principles of Biostatistics* (5 credits) or BIO-HPM 203bcd, *Statistical Methods for Health Policy and Management* (Module I,II,III) (2.5 credits each period)

2. EPI 200a, *Introduction to Epidemiology* (2.5 credits) or EPI 201a, *Principles of Epidemiology* (2.5 credits)

Applicants to programs in the biological sciences who lack background in medicine or biology are advised to take EH 205ab, *Human Physiology*, or a course in general biology elsewhere. Beyond these minimal course requirements, each department may specify additional courses that are necessary to satisfy degree requirements in the particular area of specialization.

Master of Occupational Health

The program leading to the degree Master of Occupational Health (MOH) is designed to train physicians in the public health disciplines relevant to preventing occupational disease and injury. This one-year degree program is usually taken as part of a two-year approved residency in occupational medicine. Additional information on the program can be found in the description of the Department of Environmental Health.

Background of Applicants Candidates must be graduates of an approved school of medicine. Individuals from the United States should have completed an internship or residency of at least 12 months in a hospital approved by the American Medical Association.

Requirements for the Degree Candidates for the MOH degree spend one year in residence at the school and must complete a program of at least 40 credits. All candidates must take the following courses unless they can demonstrate equivalent preparation. The required courses comprise 30 credits; additional courses may be selected from the curriculum approved for residencies in occupational medicine.

1. BIO 201ab, *Principles of Biostatistics* (5 credits)

2. EH 231cd, *Occupational Health Policy and Administration* (2.5 credits)

3. EH 232cd, *Introduction to Occupational Medicine* (2.5 credits)

4. ID 263 bc, *Practice of Occupational Health* (5 credits)

5. EPI 201a, *Principles of Epidemiology* (2.5 credits)

6. EPI-EH 215 cd, *Environmental and Occupational Epidemiology* (2.5 credits)

7. TOX-EH 204ab, *Principles of Toxicology* (5 credits)

8. EH 243ab, *Ergonomics/Human Factors* (2.5 credits) or EH 241cd, *Occupational Safety* (2.5 credits)

9. HSB 200ab, *Social and Behavioral Dimensions of Public Health* (2.5 credits)

Not required, but strongly recommended: BIO 210cd, *The Analysis of Rates and Proportions* (5 credits), or BIO 211cd, *Regression and Analysis of Variance in Experimental Research* (5 credits).

Doctor of Science

The Doctor of Science (SD) degree is granted upon successful completion of a program of independent and original research in one of the basic disciplines of public health, the presentation of this research in an acceptable thesis, and by meeting the school's residency requirements.

Because specific prerequisites and degree requirements vary with the discipline or field of specialization, prospective applicants should consult the sections of this book which describe departmental and interdisciplinary degree programs. They are also encouraged to contact the department or program to which admission is sought for more detailed information.

An applicant may be admitted to a doctoral program in more than one discipline, if the program meets the requirements of both departments involved.

Background of Applicants Applicants to the SD program must hold at least a bachelor's degree. In some instances an applicant will be expected to complete the SM degree at the school before being granted admission to doctoral study, in which case the student will first be admitted to an SM program.

Requirements for the Degree Students enrolled in the SD program must complete the residency requirement by paying two years of full-time tuition and one year of full-time reduced tuition and by maintaining satisfactory progress in an academic program approved by the department(s) of concentration and by the Committee on Admissions and Degrees.

In addition to satisfying the residency requirements, doctoral students are required to complete a minimum of 40 credits in graduate-level courses distributed over one major and two minor fields. Each minor field consists of at least 10 credits in formal classes. Such requirements may be increased in cases where the student has declared two major fields, or reduced in cases of prior relevant course work or experience. (However, the residency requirements described above must still be fulfilled.) Courses in the major and minor fields must be completed with grades of B- or better.

Unless equivalent preparation can be demonstrated, doctoral students must take one of the introductory epidemiology courses (EPI 200a or EPI 201a), as well as courses in biostatistics at an intermediate level (ordinarily BIO 210cd, *The Analysis of Rates and Proportions*, or BIO 211cd, *Regression and Analysis of Variance in Experimental Research*). Departments may stipulate specific course requirements and normally require written and/or oral examinations on the course work in the three fields.

Qualifying Examination By the end of the second year, students should be prepared to take the oral qualifying examination, which is intended to assess a student's potential to perform research in his or her chosen field. Since most doctoral research in the school requires a substantive knowledge of more than one discipline or field, the examining committee includes faculty from disciplines representing the minor fields as well as the major field, and the examination includes questioning in both the minor and major fields.

A research committee consisting of the student's advisor and other faculty members should be appointed within one month after the qualifying examination is passed. The committee guides the student's research through to completion, meeting with the student at least once every six months to discuss details of his or her progress.

Thesis An acceptable thesis must be submitted within five years of the date of registration as a doctoral candidate. Occasionally, upon approval of the student's research committee and of the Committee on Admission and Degrees, and only after the successful completion of the oral qualifying examination, thesis work may be performed in nonresident status. The thesis consists of one or more manuscripts suitable for publication in a specific medium appropriate to the candidate's field. A thesis is accepted only after a public presentation and discussion has been held, with the research committee in attendance.

The handbook, *Guidelines for Doctoral Students*, is distributed during fall registration. This guide outlines in greater detail the requirements and procedures of the doctoral programs.

Doctor of Public Health

Like the SD degree described above, the Doctor of Public Health (DPH) is an advanced degree granted upon successful completion of an approved program of independent and original investigation in a special field of public health and the presentation of the results of this research in an acceptable thesis. Formal requirements for the DPH program are the same as those for the SD. The primary difference between the two degree paths lies in the background of the degree candidates.

Background of Applicants Most applicants for admission to the DPH degree in a special field of public health hold a doctoral degree in medicine, dental medicine, or veterinary medicine. Depending on the intended field of specialization, consideration may also be given to a candidate who holds an advanced degree in one of the disciplines basic to public health. The applicant must also hold, or be in progress toward the MPH degree, or its equivalent, from an approved institution.

Master of Public Health Program

Gareth M. Green, Program Director and Associate Dean for Professional Education

The program leading to the Master of Public Health (MPH) degree is designed to prepare health professionals for leadership in public health. The majority of applicants are midcareer professionals preparing for advancement in their organization or for transition to a new field. Graduates are employed in health care management, health policy, public health administration, occupational and environmental health, and academic positions in the public and private sectors.

Program Description The program begins with core courses in the basic public health disciplines of biostatistics and epidemiology, biological and environmental health sciences, behavioral and social sciences, public health policy and management, and public health practice. These core courses account for approximately one-half of the credit units taken.

Concentrations **All applicants to the MPH program select one of the concentrations offered.** Within a concentration, students pursue in depth one or more areas of particular relevance to their career goals.

Health Care Management prepares graduates to administer large health care institutions, primarily in the private sector, or to evaluate medical practices. Special-emphasis tracks are offered in finance and reimbursement, quality of care and risk management, technology assessment and decision analysis, operations and personnel management, and dental care management.

Public Management and Community Health prepares graduates for leadership positions in the public sector, including federal, state, and local health departments and community health settings. Special-emphasis tracks are offered in maternal and child health, finance and regulation of health services, mental health and substance abuse, and health promotion and disease prevention.

Occupational and Environmental Health provides training in toxicology, epidemiology, industrial hygiene and safety, legal and policy issues, and occupational health management for careers in environmental health agencies, the military services, and private-sector corporations. Physicians completing the track in occupational medicine satisfy the American Board of Preventive Medicine requirement for didactic training in occupational medicine. Tracks include occupational medicine, occupational health, and environmental health.

International Health prepares health professionals for leadership roles in international health, especially the health care of disadvantaged populations in developing countries. Areas of special interest include international health policy and management, health economics and the financing of health care, population, reproductive health, nutrition, child health, infectious disease epidemiology, and ecology.

Quantitative Methods prepares students for professional careers that require a high level of quantitative skills, including epidemiology, biostatistics, decision sciences, demography, and evaluation.

Clinical Effectiveness is intended to prepare clinicians for leadership roles in evaluating and improving all aspects of health care delivery. This concentration is concerned with identifying the most appropriate, ethical, and cost-effective means of providing health care through prevention, early detection, or treatment. This concentration is limited to clinicians enrolled in the Program in Clinical Effectiveness (see page 47). Areas of special interest include clinical epidemiology and biostatistics, cost-effectiveness analysis, medical decision analysis, health services research, quality improvement in health care, and measurement of health-related quality of life.

Law and Public Health The dramatic expansion of legal and regulatory issues in health fields has resulted in a critical need for lawyers with formal training in the health sciences and public health disciplines. Lawyers may pursue a comprehensive program in the health sciences and medical care delivery, or may tailor their programs to pursue special interests such as public health regulation, medical malpractice and risk management, health care finance regulation, environmental and occupational health regulation, biomedical and pharmaceutical industry regulation, international health law, and human rights and health.

Degree Requirements MPH degree candidates normally complete the program in nine months of full-time study at the school. A minimum of 40 credits is required, but students are encouraged to take a total of 45 to 50 credits. In some instances, with the approval of the Committee on Admissions and Degrees, a student may complete the program by enrolling half-time over a period of two

academic years. To supplement their studies, students may take courses in other faculties of Harvard University such as the Law School, Medical School, John F. Kennedy School of Government, Graduate School of Education, Graduate School of Arts and Sciences, and Graduate School of Business Administration.

Background of Applicants MPH students come from all parts of the world, bringing to the program a wide variety of backgrounds and experiences. Most applicants to the MPH program have received a professional degree in medicine, dentistry, veterinary medicine, nursing, or law. Applicants with a doctoral degree in a field important to public health (such as biology, behavioral sciences, nutrition, other natural and social sciences, economics, or engineering) are also considered for admission.

Consideration may be given to applicants who have a master's degree in a field closely related to public health and substantial relevant postgraduate professional experience, usually at least three years in an administrative position of responsibility. The particular interests of certain populations (noted below) are served by specially assigned advisors and specific seminars and courses.

Medical and Dental Students Students enrolled in an MD, DMD, DDS, or DVM program and who have a career interest in public health and preventive medicine may apply for concurrent admission to the MPH program. A combined program must meet the approval of both the Committee on Admissions and Degrees and the institution from which the doctoral degree will be awarded. A planned approach to joint degree training is necessary. Students should apply early in their doctoral training to allow for maximum flexibility in acquiring credentials for both degrees. Requirements for the MPH degree are the same for students in the combined degree program as for all other MPH degree candidates. Students in this program receive the MPH upon successful completion of both degree programs and conferral of the doctoral degree.

Preventive Medicine Residency The MPH program also serves as a required academic year for residency training in preventive medicine, aerospace medicine, or occupational medicine. The occupational medicine residency is described in the section on the Department of Environmental Health. Students planning to qualify for certification in preventive medicine should declare this intent and review their planned curriculum with the MPH Office at the beginning of the school year to assure that it meets all requirements.

Additional Degrees Some students choose to continue their studies at the school after completing the MPH degree. These students may apply for a Master of Science or doctoral program in any of the departments which offer such programs. Students who apply for a second degree after the MPH may wish to consider a practicum/field placement during the summer between the two programs.

For More Information Write to Roberta Gianfortoni, Director for Professional Training, HSPH, 677 Huntington Avenue, Boston, MA 02115, or call 617/432-0090.

Dentists may contact Dr. Chester W. Douglass at the Harvard School of Dental Medicine, or call 617/432-1456.

Department of Biostatistics

Nan M. Laird, Henry Pickering Walcott Professor of Biostatistics and Chair of the Department

Faculty Professors D. Harrington, Lagakos, Pagano, Robins, Rosner, Tsiatis, Ware, Wei, Weinstein, and Zelen; Visiting Professor Patel; Associate Professors DeGruttola, Finkelstein, Gelber, Gelman, Gray, Greenes, Orav, L. Ryan, and Schoenfeld; Assistant Professors Davis, Gatsonis, Hughes, K. Kim, Lipsitz, Neuberg, Propert, Rotnitzky, Spiegelman, Spino, Waternaux, Williams, and Wypij; Visiting Assistant Professor H. Kim; Lecturers Amato, Stanley, Testa, and Wyshak

Adjunct Faculty Associate Professor Mehta

The programs in the Department of Biostatistics prepare students to contribute to the theory and practice of statistical science as applied to health. The department's research in statistical methods and its interdisciplinary collaborations provide many opportunities for student participation. The school and the department have computing facilities which support all the commonly used statistical packages.

The faculty includes leaders in the development of statistical methods for clinical trials and observational studies, studies on the environment, animal experiments, and longitudinal studies. Members of the department serve on a large number of national and international advisory committees.

The department sponsors several working seminars to foster student and faculty interest in current research areas. The working seminar topics for the 1992-93 academic year were Bayesian methodology, risk and decision making, nutrition and obesity research, longitudinal data, psychiatric statistics, statistical issues in the environment, statistical methods in epidemiology, statistical methods in HIV, and cancer clinical research.

An introductory course in biostatistics is required of all students in the school. Many students take additional courses in the department. The department offers courses at the elementary, intermediate, and advanced levels. Elementary courses assume little background in mathematics and are designed for a wide audience. These courses develop facility in quantitative reasoning, a command of basic methodology, and a critical appreciation of good statistical practice in the health sciences. Intermediate courses are designed to develop methodological skills in specific areas of application, such as epidemiology, health policy, and experimental science. Advanced courses require a strong background in mathematics and are primarily intended for degree candidates in biostatistics.

Current Departmental Research

- Statistical methodology in environmental research, including health effects of indoor and outdoor air pollution, carcinogenicity testing, environmental monitoring, carcinogenic and teratogenic effects of chemicals
- Research and development of statistical and computing methods for clinical trials, including sequential methods and survival models; environmental and epidemiologic research including methods for longitudinal studies, analyses with incomplete data, meta-analysis, and statistical aspects of the study of AIDS
- Collaborative clinical research in the treatment of cancer and AIDS in more than 200 national and international clinical trials
- Quantitative problems in health risk analysis, technology assessment, and clinical decision making, including new methods for assessing risks and benefits associated with environmental regulations
- Statistical methodology in psychiatric research and collaborative research in mental health, including clinical psychopharmacology trials, longitudinal naturalistic studies, and family studies
- Collaborative research activities with biomedical scientists at the Harvard Medical School and affiliated hospitals

Degree Programs Master of Science in Biostatistics, Doctor of Science, and Doctor of Public Health. Please refer to page 13 for information about the Master of Public Health concentration in Quantitative Methods.

Programs

Biostatistics
Health Decision Sciences

Biostatistics The main program in the department is biostatistics. Both the Master of Science and the doctoral degree programs provide rigorous training and practical experience in statistical methods for the biomedical sciences. The primary emphasis of the department is doctoral training, and course offerings reflect this orientation. The department offers a master's program mainly to prepare students for doctoral study. A limited number of qualified students can pursue the master's degree only.

Required course work includes probability, statistical inference, statistical methodology, and epidemiology. Electives include advanced courses in biostatistics as well as courses in the biomedical sciences and health policy and management. Students are given experience in computing and have the opportunity to teach in the department's school-wide courses. They also develop consultative and data analytic skills through participation in the activities of the Biostatistics Consulting Laboratory.

At the end of their third semester, doctoral candidates are required to take and pass a written qualifying examination and in the following 12 months make an oral presentation of research plans. Students who enter the doctoral program with a master's degree in biostatistics or statistics are encouraged to take the written qualifying examination in their first year of study. The doctoral thesis may include either original contributions to statistical methodology related to the health sciences or an innovative application to a field of public health or medicine.

Health Decision Sciences This program offers master's and doctoral training in quantitative techniques in decision making at individual (clinical) and collective (policy) levels. In addition to core courses in probability and biostatistics, students take courses in decision analysis, cost-benefit and cost-effectiveness analysis, operations research, applied economics, behavioral decision theory, and computing. Applications to medicine, health care policy, and environmental risk analysis are emphasized. This is a joint program with the Department of Health Policy and Management. Students in this program may be enrolled in either department.

Concentrations
The department offers special concentrations in three areas of predoctoral training under funding from the National Institutes of Health: statistical methods in cancer research, environmental health, and psychiatric biostatistics. Students in all concentrations complete the regular training program in biostatistics, with additional substantive coursework in their area of concentration. Students also participate in relevant working seminars in their concentration, and engage in faculty supervised internships during the summer.

Background of Applicants Applicants to programs in biostatistics should have strong preparation in mathematics and an interest in the health sciences. It is recommended that the mathematical preparation include at least one year of analysis past elementary calculus and linear algebra. Knowledge of a high-level computing language, such as C, FORTRAN, or PASCAL, is also recommended.

Students may enter the doctoral program directly or as a sequel to the master's program. Students entering the doctoral program as a sequel to the master's program are expected to take the written qualifying examination in the first year of the doctoral program. The path to the doctoral program depends on the student's level of preparation at the time of application. Students desiring a doctorate are encouraged to apply directly to the doctoral program. Doctoral applicants with insufficient preparation will be considered for the master's program.

Career Outlook The career outlook for biostatisticians is excellent. There are many more open positions than available candidates. The shortage of biostatisticians is expected to continue through this decade. Recent graduates have assumed faculty posts at universities and schools of public health and positions in research laboratories and centers in the federal government, in pharmaceutical companies, and in research institutes.

For More Information write to Dr. Nan M. Laird, Department of Biostatistics, HSPH, 677 Huntington Avenue, Boston, MA 02115, or call 617/432-1056.

Department of Cancer Biology

Myron E. Essex, Mary Woodard Lasker Professor of Health Sciences and Chair of the Department

Faculty Professors Glimcher, Haber, Haseltine, Hirsch, and Little; Associate Professors Kanki, Kelsey, T. Lee, Liber, and Sodroski; Assistant Professors Grusby, A. Lee, Nickoloff, Reed, and Yandell; Visiting Assistant Professor Carini

The Department of Cancer Biology is primarily involved in research into the causes of cancer. It offers training programs in basic and applied research leading to two doctoral degrees: Doctor of Science for candidates holding a clinical degree (MD, DVM, DMD); and a PhD for candidates entering the Biological Sciences Program in Public Health (BPH), offered through the Division of Medical Sciences. Research activities are centered in the department's Laboratories of Radiobiology, Immunology, and Virology.

Current Departmental Research
- Mechanisms of mutagenesis and DNA recombination, including precise changes in DNA sequences produced by radiation and chemical carcinogens
- Induction of mutation and malignant transformation in mammalian cells by low and high LET radiations and by chemical agents, including activation of proto-oncogenes and loss of tumor suppressors in carcinogenesis
- Cytogenetic effects of physical and chemical carcinogens
- Role of viruses in the cause of cancer, including RNA tumor viruses as causes of leukemias, lymphomas, and neurological diseases
- Role of HIV-1 and HIV-2 in pathogenesis of AIDS and characterization of the family of retroviruses associated with this disease
- Development of HIV vaccines and antiretroviral interventions
- Molecular regulation of immune responsiveness
- Role of MHC class II in tumor-specific immunity

Degree Programs Doctor of Science applicants should apply directly to the Department of Cancer Biology at the School of Public Health.

PhD applicants should apply to the Division of Medical Sciences Biological Sciences in Public Health Program (BPH) indicating an interest in the Department of Cancer Biology. Please refer to the Division of Biological Sciences entry in this catalogue.

Areas of Concentration
Immunology
Radiobiology and Carcinogenesis
Virology

The department aims to develop the basic skills in laboratory techniques and data handling necessary for undertaking original research. Course work during the first one to two years emphasizes cancer biology, cellular and molecular biology, virology, immunology, radiation biology, and genetics. Additional courses are available in several areas of microbiology, biochemistry, and cell biology at the Harvard Medical School, at other Harvard graduate schools, and at MIT. Students are encouraged to participate in the numerous seminar series and informal discussion groups offered on the Longwood campus. The department emphasizes publication of research results in the standard research literature. Most doctoral students in the department publish several papers before completing the degree. The latter part of the degree program involves intensive laboratory research under the guidance of a faculty advisor in the student's area of concentration.

Background of Applicants Applicants with a bachelor's degree in chemistry, biology, or molecular biology are encouraged to apply to the PhD program in Biological Sciences in Public Health through the Division of Medical Sciences. Applicants should indicate the appropriate area of concentration within the Department of Cancer Biology program and follow submission guidelines outlined for the Division of Biological Sciences. Applicants with a clinical degree in medicine, dentistry, or veterinary medicine are also encouraged to apply to the Doctor of Science program. Such applicants should apply directly to the Department of Cancer Biology and must follow submission guidelines for the School of Public Health.

Career Outlook Typical positions taken by recent graduates include postdoctoral research fellowships, junior faculty positions at academic institutions, and positions in independent research institutes, in governmental agencies, and in the biotechnical industry.

For More Information about the Doctor of Science program write to Ms. Jacqueline Breen, Department of Cancer Biology, HSPH, 665 Huntington Avenue, Boston, MA 02115, or call 617/432-0975. For more information about the PhD program write to Ms. Ruth Kenworthy, Division of Biological Sciences, HSPH, 665 Huntington Avenue, Boston, MA 02115, or call 617/432-4470.

Department of Environmental Health

Joseph D. Brain, Cecil K. and Philip Drinker Professor of Environmental Physiology and Chair of the Department

Faculty Professors Drazen, Fredberg, Green, J. Harrington, Monson, Smith, Speizer, and Spengler; Associate Professors Burge, Chapman, Christiani, Dockery, Evans, Godleski, Kelsey, Koutrakis, P.B. Ryan, Shore, and Yanagisawa; Assistant Professors Ford, R. Goldman, Hu, Kobzik, Milton, Neas, Paulauskis, Shea, Warner, and Xu; Senior Lecturer Sherwood; Lecturers Rudnick, Shapiro, and Snook

Adjunct Faculty Associate Professors Butler, Eisen, and Valberg; Assistant Professor Hashimoto; Lecturer Nobel

The Department of Environmental Health is concerned with the detection and prevention of adverse health effects caused by chemical and physical factors in occupational and community settings in this country and around the world. The problems are complex and require the insights of many specialties. The department's faculty, research staff, and students reflect the multidisciplinary nature of the field and include applied mathematicians, chemists, engineers, epidemiologists, physicians, occupational health nurses, physiologists, and physicists.

Each of the programs offers financial support to qualified individuals on a competitive basis.

Current Departmental Research
- Inhalation toxicology, comparative respiratory physiology, and deposition and clearance of particles in the respiratory tract
- Cell and molecular biology of the respiratory system, especially lung macrophages
- Acute and chronic occupational and environmental epidemiologic studies of working and community populations exposed to various toxic materials
- Mechanical properties of lungs and chest wall, development of pulmonary function tests and testing equip-

ment, and application of these methods to the study of respiratory disease in occupational and community environments

- Micromechanics and neurophysiology of respiration of lung parenchyma, stereology, roles of surface and tissue stress-bearing elements
- Multimedia assessment of exposure to toxins and their health effects (PCB, pesticides, lead, cadmium)
- Design and evaluation of local exhaust systems and respiratory protection devices for the protection of workers
- Measurement and modeling of ambient, indoor, and personal exposures to gases and aerosols: radon, ozone, carbon monoxide, nitrogen dioxide, volatile organic compounds (e.g., formaldehyde, benzene), nicotine, fibers, metals, and acidic aerosols
- Development of instrumentation and methods for collection of particles and pollutant gases in industrial and environmental conditions; measurement of acidic gases and particles
- Development and application of biological markers of exposure and disease in animals and humans
- Airway physiology and pharmacology, asthma, chronic diseases of airways
- Statistical and methodological issues in the analysis of data from occupational and environmental health studies
- Risk assessment and risk management for the evaluation of hazardous waste sites, toxic air pollutants, indoor contaminants, control strategies and research programs
- International occupational and environmental health studies in collaboration with researchers in Mexico, China, Spain, Republic of Korea, Taiwan, the Netherlands, Germany, and other countries

Degree Programs Master of Science in Environmental Health, Master of Science in Physiology, Master of Occupational Health, Doctor of Philosophy (awarded primarily through the Physiology Program), Doctor of Public Health, and Doctor of Science. Please refer to page 13 for information about the Master of Public Health concentration in Occupational and Environmental Health. Applications to the PhD program must be received by the school before January 1.

Those interested in applying to the PhD degree should refer to the Division of Biological Sciences section in this catalogue.

Academic Programs and Areas of Concentration

Environmental Epidemiology

Environmental Science and Engineering

- *Environmental Health Management (Quantitative Risk Assessment)*
- *Environmental Health Sciences (Pollution Prevention, Exposure Assessment, Radiological Health, Air Pollution Management)*
- *Industrial Hygiene and Occupational Safety (IH/OS Practice, Hazardous Waste Site Safety, Exposure Assessment and Control Technology)*

Occupational Health

- *Occupational Health Nursing*
- *Occupational Medicine*
- *Occupational Safety and Health*

Physiology

Career Outlook Some positions taken by recent graduates of the various programs offered by the Department of Environmental Health include industrial hygienist, epidemiologist, environmental engineer or scientist with federal and state agencies, unions, consulting companies, and corporations. Doctoral graduates have academic positions in schools of medicine, public health, and nursing. Others have management, research, and consulting positions in government and private organizations.

Environmental Epidemiology

Frank E. Speizer, Professor of Environmental Science and Director of the Program in Environmental Epidemiology

This program offers training at both the master's and doctoral level in preparation for research careers in environmental epidemiology. Major work at present is directed toward assessing the possible effects of sulfur oxides, nitrogen dioxide, ozone, particulate matter, acid aerosols, and other pollutants on respiratory disease. Adults and children are being studied in long-term follow-up studies, cross-sectional cohort studies, and short-term panel studies. Exposure measurements are being refined through monitoring of specific chemical species, indoor monitoring in homes and schools, and personal sampling. In addition, more sensitive measures of health response are being implemented. The range of population exposures is being expanded through collaborative investigations in extremely polluted developing

countries, for example, Mexico, China, and Czechoslovakia. A rich data base of pollution and health measurements is available for collaborative research by students.

Background of Applicants Candidates are generally doctoral students or postdoctoral trainees with qualifications in medicine or biostatistics.

For More Information write to Dr. Douglas W. Dockery, Assistant Director of the Program in Environmental Epidemiology, HSPH, 665 Huntington Avenue, Boston, MA 02115, or call 617/432-0729.

Environmental Science and Engineering

John D. Spengler, Professor of Environmental Health and Director of the Program in Environmental Science and Engineering

This program emphasizes the chemical, physical, microbiological, engineering, and risk assessment aspects of environmental and occupational exposures. Master's and doctoral degree programs are offered in Environmental Health, Environmental Health Management, and Industrial Hygiene and Occupational Safety.

Background of Applicants Environmental Science and Engineering candidates normally have a bachelor's degree in engineering, chemistry, physics, mathematics, or biology. Preparation in the sciences ordinarily includes courses in differential and integral calculus, general and organic chemistry, and physics (mechanics). The master's degree is normally earned after two years. Applicants with exceptional undergraduate credentials, advanced degrees, or two years or more of relevant experience may request consideration for admission to a one-year SM program.

In addition to the school-required basic biostatistics and epidemiology courses, all students take basic environmental science courses which include exposure assessment, environmental chemistry, physiology, and environmental/industrial toxicology. Advanced courses in environmental science may have a wide scope or may be oriented toward a specific medium (such as air, surface water, or groundwater) or pollutant (such as ionizing radiation); they may focus on monitoring, modeling, or the control of the pollutants; they may emphasize resources and occupational management, regulation and policy. Most students take courses offered at Harvard's John F. Kennedy School of Government or at MIT.

Environmental Health The master's and doctoral programs in environmental health may focus on specific problem areas, such as air and water quality and control, environmental microbiology, or radiological health (radiation protection). This program allows flexibility for the student to acquire the foundation in science, quantitative methods, regulation, and policy necessary for technically oriented career positions.

Environmental Health Management The master's and doctoral programs in environmental health management are intended for students interested in quantitative approaches to the evaluation and management of the environment. In addition to the basic and selected advanced environmental science courses described above, students complete courses in biostatistics, decision sciences, risk assessment, and economics.

Courses in data analysis and inference include topics such as multiple regression and analysis of variance. The required courses in decision sciences familiarize students with concepts and techniques from risk assessment, operations research, statistical decision analysis, and economics.

These courses are supplemented by electives, such as environmental law, environmental and natural resource policy, environmental or regulatory economics, computer science, and cancer biology. Students particularly interested in hazardous waste management or groundwater contamination normally take about one-third of their courses outside the Harvard School of Public Health. Students are encouraged to participate in summer internships.

Industrial Hygiene and Occupational Safety The master's and doctoral programs in industrial hygiene and occupational safety are designed to help meet the demand for professional personnel with the skills and scientific knowledge needed to identify and control health problems of the workplace. In addition to the basic and selected advanced environmental science courses described above, the core curriculum also includes courses in manufacturing processes, safety and ergonomics, and radiological health. Additional courses in risk assessment, policy and administration, and occupational/environmental law are available. A subspecialty in industrial hygiene, the Hazardous Substance Academic Training Program, sponsored in part by a grant from the National Institutes of Occupational Safety and Health, will begin during academic year 1993-94. The goal of this program is to help

fill the growing need for industrial hygienists who are trained in the evaluation and control of health problems at hazardous waste sites. Three new courses have been developed for this program.

Internship Program Students specializing in industrial hygiene normally participate in an internship program in which they work for six months (June-December) in positions coordinated by faculty. Students specializing in environmental health sciences are also eligible to participate. The work may include assessment and control of toxic substances, noise, radiation, heat stress, and so forth. Students may earn salary as well as credits toward a 60-credit or 80-credit Master of Science degree. Normally, internships begin after second semester with the student returning for the spring semester of the second year.

For More Information write Mrs. Linda Fox, Program Administrator, HSPH, 665 Huntington Avenue, Boston, MA 02115, or call 617/432-3351. Doctoral applicants should contact Mrs. Fox to arrange an interview with faculty in the program.

Occupational Health

Richard R. Monson, Professor of Epidemiology and Director of the Educational Resource Center for Occupational Safety and Health

The training programs in occupational safety and health listed below are offered through the NIOSH-sponsored Educational Resource Center for Occupational Safety and Health at Harvard (see page 53). In addition to the master's programs described below, physicians, nurses, and others interested in occupational health may apply for training at the doctoral level.

Industrial Hygiene and Occupational Safety The two-year master's program in industrial hygiene and occupational safety is an integral component of the Educational Resource Center for Occupational Safety and Health. Admissions and curriculum are administered through the department's Environmental Science and Engineering Program, described on page 19.

Occupational Health Nursing Two programs in occupational health nursing are offered by the Educational Resource Center for registered nurses. Students in these programs are eligible to be considered for NIOSH traineeships.

A one-year master's program for the preparation of occupational health nurse practitioners is offered by Simmons College and the Educational Resource Center. Students are prepared to assess and treat primary health care problems while focusing on health care workers. Industrial settings, clinics, and hospital-based occupational health programs serve as practicum sites. Research courses culminate in a paper. Upon completion of requirements the Master of Science in Primary Health Care Nursing (Occupational Health) is awarded by Simmons College.

A two-year/two-degree program is available to prepare nurses as occupational health nurse practitioners with emphasis on identification of health hazards, workplace assessment, program planning and intervention, worker health promotion, and disease and injury prevention. This program integrates curricula from the Harvard School of Public Health and Simmons College, with courses taken concurrently at both institutions. Nurses interested in this program must apply to and be accepted by both schools. Upon completion of requirements, the Master of Science in Environmental Health (Occupational Health) is awarded by Harvard University and the Master of Science in Primary Health Care Nursing (Occupational Health) by Simmons College.

Background of Applicants Applicants must have at least a bachelor's degree in nursing from a program accredited by the National League of Nursing. In addition to submitting an application to the degree program, applicants must show evidence of satisfactory completion of a basic statistics course and registration to practice nursing in a US state or territory.

For More Information about the program and financial support which may be available for United States citizens or permanent residents through traineeships or scholarships, write to Ms. Susan Legendre, Occupational Health Program, HSPH, 665 Huntington Avenue, Boston MA 02115, or call 617/432-3327.

Occupational Medicine The one-year program in occupational medicine leads to either the Master of Occupational Health (MOH) or the Master of Public Health (MPH) degree. Physicians are trained in the public health disciplines relevant to the prevention and control of occupational disease and injury. The course work includes epidemiology, biostatistics, occupational medicine, toxicology, industrial hygiene, ergonomics/safety, health policy, and administration. For physicians in the Occupational and Environmental Residency, the master's program is the first phase of the two-year residency program.

The practicum year of the Occupational and Environmental Medicine Residency at the Harvard School of Public Health emphasizes the development of skills in clinical occupational medicine and occupational epidemiology. During this year, acquired knowledge and abilities are applied to patient management and workplace problem solving, and at least one short-term research project is designed, executed, and documented under faculty supervision. Field experience includes rotations through hospital-based occupational health clinics, the Massachusetts Division of Occupational Hygiene, and corporate medical departments.

The Occupational and Environmental Medicine Residency is fully accredited by the Accreditation Council for Graduate Medical Education to offer the didactic training outlined above and a practicum year leading to board eligibility in occupational medicine. Dr. David C. Christiani is director of the residency.

Some financial support for residency candidates who are United States citizens or permanent residents may be available through traineeships or National Research Service Awards.

Background of Applicants Physicians currently holding positions in the field of occupational safety and health who plan to return to these positions are considered particularly strong candidates for admission. The two-year residency is open to candidates who have completed at least one year of clinical training in internal medicine or family practice; in addition, board eligibility or certification in a primary care specialty is preferred.

Admission to the Program In addition to submission of an application to the degree program, applicants should send a letter of interest to the Occupational Health Program, Harvard School of Public Health, enclosing a curriculum vitae listing medical training and experience, research experience, and publications. Admission to the practicum year of the residency is a separate process from admission to the degree program, and usually occurs shortly after admission to the degree program. Regardless of initial acceptance, continuation into the second year of the residency is contingent upon having had adequate prior clinical experience and exemplary performance in the didactic phase of the program. Applications for the degree program are reviewed and approved beginning in September for admission in September of the following year. Applicants who require early notification should indicate this in a cover letter accompanying the application forms.

For More Information write to Mr. Daryl Bichel, Occupational Health Program, HSPH, 665 Huntington Avenue, Boston MA 02115, or call 617/432-3314.

Occupational Safety and Health The master's program in occupational safety and health emphasizes the epidemiologic and biostatistical aspects of occupational safety and health. This is generally a two-year degree program, although an individual with a PhD or JD may complete the program in one year. It is anticipated that persons without a doctoral degree will subsequently enroll in a doctoral program.

Background of Applicants Applicants normally have a bachelor's degree and advanced training in science. Applicants currently holding positions in the field of occupational safety and health who plan to return to these positions are considered particularly strong candidates for admission. College-level organic and inorganic chemistry courses are required for admission.

For More Information about this program and financial support which may be available for United States citizens or permanent residents through traineeships or National Research Service Awards, write to Dr. Richard R. Monson, Occupational Health Program, HSPH, 665 Huntington Avenue, Boston MA 02115, or call 617/432-3325.

Physiology

Joseph D. Brain, Cecil K. and Philip Drinker Professor of Environmental Physiology and Director of the Physiology Program

This program offers doctoral training in preparation for research careers in respiratory physiology. Much of our research concerns the normal and pathological biology of the respiratory system. This system presents an immense, thin surface area to the environment, and thus is an important route of entry and site of damage from toxins and infections. The program focuses on such aspects as respiratory mechanics, respiratory neurophysiology and psychophysics, airway pharmacology, and respiratory defense mechanisms, especially pulmonary cell and molecular biology in relationship to macrophages. The program also emphasizes inhalation toxicology and the pathology of environmental and occupational lung disease. The biology is broadly based, ranging from molecular and cell biology to integrated organismic, environmental, and comparative physiology.

Intensive course work in the first two years may include physiology, biochemistry, cell and molecular biology, experimental pathology, engineering, toxicology, statistics, and immunology. The latter part of the program consists of research under the guidance of a faculty advisor. Collaborative research opportunities exist in several area institutions. Special facilities are available, including a confocal microscope, analytical electron microscopes, a flow cytometer, a sleep laboratory, and a sensation laboratory, as well as techniques developed by the program (e.g., magnetometric measurements of motion ranging in scale from the entire chest wall to subcellular components, computer modeling of chest wall mechanics, and laser stereology).

Background of Applicants Candidates normally have a bachelor's or master's degree in biology or the physical sciences. Candidates also frequently include veterinarians and physicians. Applicants apply for a doctoral degree; master's degree programs are not ordinarily offered.

For More Information about this program and financial support which may be available for United States citizens or permanent residents through traineeships or National Research Service Awards, write to Dr. Joseph D. Brain, Physiology Program, HSPH, 665 Huntington Avenue, Boston, MA 02115, or call 617/432-1272.

Department of Epidemiology

Dimitrios V. Trichopoulos, Vincent L. Gregory Professor of Cancer Prevention, Professor of Epidemiology and Chair of the Department

Faculty Professors L. Goldman, Li, Mann, Monson, Mueller, Robins, Tsuang, Walker, and Willett; Associate Professors Colditz, Cook, Hsieh, Maclure, Murphy, Seddon, and Stampfer; Assistant Professors Ascherio, Freeman, M. Goldman, Hunter, Krolewski, Neas, Spiegelman, Tohen, and Zahner

Adjunct Faculty Professors Adami, Paffenbarger, and Rothman; Lecturer Chan

Epidemiology is the study of the frequency and distribution of disease and its determinants. The Department of Epidemiology offers training in the application of epidemiologic methods to the investigation of diseases of unknown cause and provides training in the field of clinical epidemiology to interested students. Areas of emphasis include epidemiologic methods, malignant neoplasms, occupational diseases, cardiovascular disorders, abnormalities of reproduction and development, mental disorders, and infectious diseases.

Current Departmental Research

- Role of viruses in the etiology of cancer
- Relationship of diet and risk of cancer, cardiovascular disease, and other major chronic diseases
- Relationship between exposure to chemicals in the workplace and the development of cancer
- Relationship of hormonal patterns and breast cancer
- Factors in early life predisposing to chronic diseases
- Case identification and risk factors in mental disorders
- Health effects of oral contraceptives and post-menopausal hormones
- Causes of human infertility and epidemiology of reproduction
- Pharmacoepidemiology
- Clinical epidemiology
- Epidemiologic methods
- Cardiovascular epidemiology

Degree Programs Master of Science in Epidemiology, Doctor of Science in Epidemiology, and Doctor of Public Health. Please refer to page 13 for information about the Master of Public Health concentration in Quantitative Methods.

Programs and Concentrations

Cancer Prevention
Cancer Epidemiology
Cardiovascular Epidemiology
Clinical Epidemiology
Environmental and Occupational Epidemiology
Epidemiologic Methods
Infectious Diseases
International Health Epidemiology and Ecology
Oral and Dental Health Epidemiology
Pharmacoepidemiology
Psychiatric Epidemiology
Reproductive Epidemiology

Concentration in Cancer Prevention The Cancer Prevention Education Program aims to provide trainees with a broad and deep knowledge of the state of the science of cancer prevention, expertise in a specialized research area

in which they will be positioned to develop new knowledge, skill in policy analysis, and anchoring in professional networks through which they will be able continuously to update their knowledge of this evolving field. Social and behavioral scientists are prepared to advance knowledge on the efficiency and effectiveness of alternative strategies for inducing behavioral change at the individual institutional community or policy levels. Physicians are prepared for careers as clinical investigators or public health practitioners specializing in cancer prevention. The program brings together the Cancer Prevention Center at the Harvard School of Public Health with the Division of Cancer Epidemiology and Control of the Dana-Farber Cancer Institute in a broad and interdisciplinary education program. Students in the Cancer Prevention Education Program are expected to take the core course in cancer prevention (HSB 204).

The Cancer Prevention Education Program provides funding for doctoral students in the social and behavioral sciences, for physicians engaged in postdoctoral training, and for postdoctoral fellows in the social and behavioral sciences. Candidates must be United States citizens or permanent residents. Members of minority groups are especially encouraged to apply. For more information, write to Dr. Graham Colditz, Department of Epidemiology, HSPH, 677 Huntington Avenue, Boston MA 02115, or call (617) 432-2754.

Concentration in Cancer Epidemiology The Cancer Epidemiology Program is designed to provide research training for candidates at the doctoral or master's level or for postdoctoral fellows with prior doctoral degrees in epidemiology. In addition to research methodology, the curriculum includes courses on the biology and genetics of cancer; on the basic concepts and issues of cancer epidemiology; on the roles of diet, oncogenic viruses, and occupational exposures in the etiology of cancer; and on cancer prevention. Research opportunities for students include a large number of ongoing case-control and cohort studies within the department and in conjunction with the Dana-Farber Cancer Center.

Concentration in Cardiovascular Epidemiology The Cardiovascular Epidemiology Program is designed to provide research training for candidates for the doctoral degree or for postdoctoral fellows with prior doctoral degrees in epidemiology. The curriculum includes research methodology and courses on the epidemiology of cardiovascular diseases. Doctoral students are expected to conduct research in a substantive or methodological area related to cardiovascular epidemiology. For more information, write to Dr. Meir Stampfer, Department of Epidemiology, HSPH, 677 Huntington Avenue, Boston, MA 02115, or call 617/432-2749.

Concentration in Clinical Epidemiology This program, leading to a Master of Science degree, is designed primarily for clinicians and other health care professionals who wish to develop the quantitative and analytic skills that are needed for clinical research. All students in this concentration take core courses in epidemiology and biostatistics to develop basic skills in study design and analysis that will allow them to examine clinical questions related to the diagnosis and treatment of disease. Additional courses in epidemiology and courses offered by other departments address related topics such as health status and quality of life measurement, decision analysis, cost-effectiveness analysis, health services research, and quality improvement of health care.

Although all requirements for this concentration can be met by taking courses offered during the regular academic year, requirements can also be fulfilled by taking the courses offered in the Program in Clinical Effectiveness (see page 47). Students in the Program in Clinical Effectiveness typically take a core set of courses during a single summer period, followed by additional courses during the academic year. Students in the Program in Clinical Effectiveness who cannot attend classes during the regular academic year can fulfill the degree requirements for this concentration by taking advanced courses during a second or third summer period and by completing a supervised research project. The content of this project typically entails the design and implementation of a clinical study, the analysis of the resulting data, and the creation of a manuscript of suitable quality for publication.

Concentration in Environmental/Occupational Epidemiology Applicants with an interest in environmental and/or occupational epidemiology are encouraged to apply for a joint degree with the Department of Environmental Health and the Department of Epidemiology. Students in a master's degree program are expected to take courses in epidemiology and environmental health (including exposure assessment), occupational health (including industrial hygiene), biostatistics, and toxicology. In addition to the coursework required for master's students, doctoral students are expected to conduct research in a substantive or methodologic area related to environmental or occupational health.

Concentration in Epidemiologic Methods This program is designed to provide training in the development and application of new methods in epidemiologic research. Through courses offered by the Department of Epidemiology, students will receive training in the detailed use of and justification for classical epidemiologic methods in study design, data analysis, and interpretation of results. Through courses offered by the Department of Biostatistics, students receive training in biostatistical topics most relevant to epidemiologic research. Through advanced course work and tutorials, students are introduced to recent innovations in epidemiologic methodology. Doctoral students conduct research with faculty specializing in this area on the development of new methodology and in novel applications of existing methodology to important data sets in epidemiology. Students pursuing this concentration ordinarily have completed four semesters of college calculus and one semester of linear algebra prior to enrolling in this program.

Concentration in Infectious Diseases The study of the epidemiology of infectious diseases requires familiarity with general epidemiology and biostatistics. Because it involves vectors of infectious agents in the case of many diseases, a good understanding of vector biology is also required. Infectious diseases occur frequently in warm-climate countries with less-developed infrastructures. The study of infectious disease epidemiology, therefore, requires a solid understanding of social and cultural aspects of disease. For these reasons, a student of infectious disease epidemiology has to take courses not only in the Department of Epidemiology but also in other departments. Introductory courses are TPH 201a and TPH 202b. ID 223cd teaches the epidemiologic methods for developing countries; EPI 214d deals with outbreaks of infectious disease; EPI 224c and POE 225c treat the epidemiology of AIDS; and ID 201cd focuses on malaria. More advanced topics of infectious disease epidemiology are covered in tutorials with faculty specializing in this area (Drs. Freeman, Hunter, Mann, and Mueller), in a seminar series on the analysis of complex systems (POP 355cd), and in courses covering mathematical modeling of disease transmission and biomathematics.

Concentration in International Health Epidemiology and Ecology International health epidemiology applies and develops the methods of general epidemiology for the planning, implementing, monitoring, and evaluating of health programs in diverse settings in the developing world. Because disease patterns in developing countries are often dominated by infection, including parasitic infections, and by malnutrition, the program emphasizes control and prevention measures against these health problems. The human, organizational, and personal infrastructure for health action in many developing countries is severely constrained, and thus international health epidemiology focuses especially on theoretical and practical epidemiologic methods to monitor and evaluate the efficiency of health services.

The International Health Epidemiology program is designed for students interested in developing advanced epidemiological capabilities applied to international health problems. In addition to the Department of Epidemiology, the program includes interest areas in the Departments of Population and International Health, Biostatistics, Tropical Public Health, and Health Policy and Management. It encourages students to combine epidemiological methods with other disciplinary skills.

Concentration in Oral and Dental Health Epidemiology The purpose of this program is to prepare dentists and others interested in oral diseases for research and teaching careers in epidemiology with an emphasis on oral epidemiology and dental health. Doctoral students follow the required curriculum in epidemiology with additional course work in oral biology and the epidemiology of oral and dental diseases.

Students are required to participate in field research activities, case control studies of oral health risk factors, and clinical trials assigned to test preventive, diagnostic, or therapeutic interventions. Graduates generally pursue research careers in the field of oral epidemiology in universities, private research centers, or government research agencies.

Applicants must be dentists or other health professionals with a specific interest in the field of oral epidemiology. Funding is available for United States citizens or permanent residents. Women and minority dentists are encouraged to apply. The program is jointly administered with the Department of Dental Care Administration in the School of Dental Medicine and the Department of Epidemiology in the School of Public Health.

Concentration in Pharmacoepidemiology Research into the frequency and determinants of both unintended and expected effects of drugs and medical devices forms the core of pharmacoepidemiology. Studies of the pattern of utilization of drugs and devices, cost-benefit and risk-benefit analyses, and investigation of the distribution of diseases possibly amenable to medical intervention provide important secondary themes. The Department of Epide-

miology offers an intermediate-level course in pharmacoepidemiology, a course in the theory and use of large data resources, and a variety of ongoing research projects. Relevant courses elsewhere in the school cover such areas as clinical trials, meta-analysis, drug regulatory affairs, decision analysis, and vaccine development. Students in the pharmacoepidemiology program have the opportunity to attend courses and congresses outside the school and are encouraged to spend periods of up to three months in internships in pharmaceutical firms or regulatory agencies. Financial support for doctoral students pursuing thesis research is available. Students in the concentration ordinarily have a prior degree in medicine or pharmacology. Others are expected to acquire substantially equivalent expertise in areas related to their research.

Concentration in Psychiatric Epidemiology This program is designed to provide training in the epidemiology of mental disorders at both the master's and doctoral levels. Students are introduced to concepts and methods for studying both genetic and psychosocial factors that relate to the prevalence, incidence, and outcome of different types of psychiatric illnesses. Emphasis is given to issues of reliability and validity in studying such disorders among children, adolescents, and adults. The curriculum consists of six specialized courses as well as related courses offered in the Department of Epidemiology and in the Department of Biostatistics.

Concentration in Reproductive Epidemiology This concentration prepares individuals for research and teaching careers in epidemiology with a special emphasis on reproductive health in women and men. A wide range of relevant courses is available in the areas of epidemiology, biostatistics, environmental health (including exposure assessment and occupational health), infectious diseases, and population and international health. In addition to the coursework required for master's students, doctoral students conduct research with faculty members who specialize in this field.

Background of Applicants The master's programs provide students with basic skills in epidemiologic and quantitative methods, and in computing, in preparation for research or professional careers. The one-year Master of Science degree training program is open to applicants with a medical degree or equivalent biological background. It includes most of the courses offered by the department, plus courses in the principles of biostatistics, statistical methods in research, and computing principles and methods. Additional courses in areas of special interest and/or supervised study comprise the remainder of the program.

The two-year Master of Science degree program is designed for persons who hold a bachelor's degree and have a strong background in biology and mathematics. In addition to epidemiology and statistics courses, students take courses in basic medical sciences and the biological aspects of public health problems. The program is mainly intended for students who will continue toward a doctoral degree.

The Doctor of Science and Doctor of Public Health degree programs are designed for students who plan careers in epidemiologic research or teaching epidemiology or for those who aspire to leadership roles in the health professions. Unless course work equivalent to that described for the master's degree has been taken previously, most of the first two years is spent taking courses. Subsequently, doctoral candidates complete a thesis and gain experience in teaching and research.

The department considers applications for direct admission to the Doctor of Science (SD) program from candidates holding bachelor's degrees with strong backgrounds in biology and mathematics. For these individuals, the SD generally takes four to five years to complete; candidates with relevant doctoral degrees may complete the program in three years.

Career Outlook The career outlook for epidemiologists is good. Recent graduates have become officers in the Epidemic Intelligence Service, Centers for Disease Control; epidemiologists at the National Cancer Institute; and faculty members at universities and medical schools.

For More Information write to Ms. Mary Anne Zani, Department of Epidemiology, HSPH, 677 Huntington Avenue, Boston, MA 02115, or call 617/432-1055.

Department of Health Policy and Management

Robert J. Blendon, Roger Irving Lee Professor of Health Policy and Management and Chair of the Department

Faculty Professors Brennan, Fineberg, Frazier, Graham, Hedley-Whyte, Herzlinger, Hsiao, Levine, Newhouse, Roberts, Tarlov, and Weinstein; Associate Professors Dorwart, Epstein, Mulley, and Swartz; Assistant Professors Buerhaus, Calkins, Cotton, Latimer, Makadon, Mollica, Paltiel, Siegel, and Tsevat; Senior Lecturer

Hemenway; Lecturers Antczak-Bouckoms, Barrett, Braun, Campbell, Feldman, Kane, Kasten, Palmer, and Prothrow-Stith

Adjunct Faculty Professors Field, Greenfield, Lundberg, Pliskin, and Shepard; Associate Professors Berwick and Gostin; Assistant Professor Kaplan; Lecturers Chalmers, Glaser, Moriarty, Moseley, Moulton, Nobel, Norris, Siegrist, and Wasek

The Department of Health Policy and Management is a mission-oriented department concerned with improving the health care delivery system and mitigating public health risks in the United States and abroad. The department is dedicated to resolving major management and health policy problems through original research, advanced training, and dispute resolution. Research priorities are organized in six broad areas: health financing and insurance; management of health hazards; management of health care organizations; management and evaluation of medical technology; business and labor in health; and international health. The department's problem-solving orientation is exemplified by its strong ties with leading health practitioners in hospitals, HMOs, community health centers, health advocacy groups, corporate medical departments, health and environmental consulting firms, state and local health departments, legislative committees, federal regulatory agencies, and international agencies. Practical problem-solving skills are emphasized by an interdisciplinary faculty that includes management specialists, decision analysts, accountants, physicians, lawyers, policy analysts, economists, political scientists, and program evaluators.

Current Departmental Research

- *Health Financing and Insurance* Designing new systems for payment of physicians; predicting the responses of hospitals and physicians to reforms in the hospital reimbursement system; estimating the costs and benefits of increasing Medicaid coverage for the uninsured poor; designing public policies to cope with medical malpractice, litigation, and rising insurance premiums
- *Management of Health Hazards* Comparing the effectiveness of alternative AIDS prevention policies (e.g., premarital screening, contact tracing); using risk assessment to set priorities for environmental health protection; quantifying the health benefits of exercise; devising new approaches to enhancing highway safety; designing clinical and policy strategies to protect the health of underserved populations
- *Management of Health Care Organizations* Applying concepts of corporate strategic planning to the challenges faced by leaders of America's major health systems and pharmaceutical firms; measuring and enhancing the quality of medical care; using survey methods to track long-term trends in public confidence in hospitals and in health care professionals; analyzing financial health of health care organizations.
- *Medical Technology* Developing new analytic tools for technology assessment; performing meta-analyses of data from clinical trials; estimating cost-effectiveness of new technologies for treatment of coronary heart disease
- *Business and Labor in Health* Comparing responses of business and labor to the AIDS epidemic; negotiating occupational health and safety and health care benefits in the collective bargaining process
- *International Health* Evaluating the cost-effectiveness of health programs in developing countries; analyzing means of financing health services; examining strategies to improve health conditions in developing countries; analyzing development policies and health effects
- *Quality of Health Care* Designing better methods for measuring quality of health care and demonstrations of how quality measurements can help providers to improve their performance, including a quality review system to fulfill the congressional mandate to extend quality monitoring into physicians' offices; and a quality review system for senior managers and clinicians in health care plans to monitor quality of performance of clinical management systems
- *Health Care Reform Project* Developing partnerships between the department and the corporate community to explore critical aspects of health policy and management; clarifying the underlying forces driving the national debate on health care reform; and developing solutions that acknowledge the pluralism inherent in our society

Degree Programs Master of Science in Health Policy and Management (two-year and nine-month programs); PhD in Health Policy (awarded by the Harvard University Graduate School of Arts and Sciences). Please refer to page 13 for information about the Master of Public Health concentration in Health Care Management.

Master of Science in Health Policy and Management (Two-Year Program) The two-year master's program is designed for students who are building professional careers in health-related fields and who aspire to leadership roles in either the public or private sector. The key elements of the program are an emphasis on professional skills and concepts, a solid grounding in the substance of health problems, rigorous quantitative training, and a curriculum which combines professional, academic, and clinical activities. The program is based on the premise that training in an academic setting should be enriched by experience in problem-solving situations and work in a health setting. The curriculum is applied to practical situations through a required summer internship program and an applied field research program.

All students in the two-year program take courses in epidemiology, statistics, and economics. In addition, students are required to satisfy the requirements of at least one of five concentrations.

Background of Applicants The program seeks candidates from a wide variety of undergraduate fields whose work experience and academic record, particularly in quantitative and analytic courses, suggest outstanding potential in the areas of health policy and management.

Candidates are expected to have at least two years of relevant post-baccalaureate work experience in the health field; exceptions are occasionally made for outstanding applicants. Deferred admission is available for applicants who demonstrate strong potential in the field but who lack sufficient professional experience in the health sector. Students offered deferred admission work within the health field in a position approved by the program for a minimum of one year before matriculating.

Programs and Concentrations
Health Financing and Insurance
Management of Health Hazards
Management of Health Care Organizations
International Health
Health Research and Analysis

Health Financing and Insurance This concentration is for students who are planning careers in the private or public sector where analytical skills in economics, accounting, and finance are critical to management or policy decisions. The required courses include financial analysis and control, health care regulation and planning, health care finance, and reimbursement systems. Examples of recommended electives include economics of the health sector, cost-benefit analysis of health programs, the role of government in the health care system, and business and labor in the health system.

Management of Health Hazards This concentration is for students who wish to become involved in the formulation of disease and injury prevention policies for corporations, labor unions, public interest groups, public sector agencies, or legislative committees. Students are required to take courses in economics, statistics, epidemiology, and management. The variety of recommended electives permits students to acquire additional skills in areas such as epidemiology and quantitative policy analysis and to develop specialties in specific health problems such as AIDS, environmental pollution, and injuries.

Management of Health Care Organizations This concentration is for students pursuing management careers in either public or private sector health care institutions. The required courses include financial analysis and control, marketing, management information systems, decision analysis, and strategic planning. Recommended electives include topics such as cost-benefit/cost-effectiveness analysis, quality assurance, risk management, and physician performance.

International Health This concentration is for students with prior international experience and relevant foreign language skills who are interested in management or policy careers in developing countries or in organizations that work extensively abroad. Required courses provide an overview of health economics, management, and policy analysis. Recommended electives include infectious disease control, demography, and political economy. This concentration is linked to the broader international health programs in the school.

Health Research and Analysis This concentration is for students looking toward doctoral education and research careers in areas such as health economics, quality of care, technology assessment, health decision analysis, cost-effectiveness analysis, cost-benefit analysis, and advanced statistical analysis. Recommended electives include topics such as survey research, epidemiologic research, economic analysis, financial analysis, and quality assessment. Second-year students are encouraged to enroll in courses relevant to their concentrations at the Graduate School of Business Administration, the John F. Kennedy School of Government, and the Graduate School of Education.

Master of Science in Health Policy and Management (Nine-Month Program) The nine-month master's program in Health Policy and Management is designed primarily for physicians (and other candidates with relevant advanced degrees) who are research-oriented and desire an intensive exposure to analytic and quantitative skills. The degree is appropriate for students interested in either domestic or international research questions.

The required courses include biostatistics, epidemiology, economic analysis, and management. Recommended electives include upper-level courses in biostatistics, epidemiology, health economics, health decision sciences, quality assurance, technology assessment, and program evaluation. Students also complete a research tutorial under the supervision of a member of the department.

Background of Applicants Candidates for the nine-month Master of Science program in Health Policy and Management generally hold graduate medical or other professional degrees and have significant experience in health services. Applicants to the program typically expect to devote a substantial portion of their careers to research, particularly in areas such as cost-effectiveness analysis and clinical decision-making.

The program is also designed to satisfy similar needs of health professionals who do not necessarily hold an advanced degree, but who have eight to ten years' work experience in the health services area with a high degree of responsibility, and who wish to acquire management and research skills relevant to their career interests.

All applicants must demonstrate through prior academic performance, work experience, and standardized test scores the ability to master the quantitative and analytic content of the program.

PhD in Health Policy The Department of Health Policy and Management participates in a joint PhD program offered in the Graduate School of Arts and Sciences in conjunction with the School of Public Health, the Medical School, and the Kennedy School. This degree is intended for students seeking teaching careers in institutions of higher learning and/or research careers in health policy.

Concentrations and Policy Areas Students in the PhD in Health Policy program choose a concentration and meet specific curriculum requirements in one of four disciplines: economics, decision analysis, statistics and evaluation science, and political and organizational analysis.

In addition to choosing a concentration, students specialize in one of three areas of policy interest: health care services, public health, and environmental health.

For More Information on the PhD in Health Policy, please contact Ms. Joan Curhan, Director, Harvard PhD Program in Health Policy, John F. Kennedy School of Government, 79 John F. Kennedy Street, Cambridge, MA 02138, or call 617/496-5412 (FAX 617/496-9053).

Please note: Application for admission to the PhD in Health Policy is made through the Graduate School of Arts and Sciences (GSAS). Applicants must meet the admission requirements and deadlines of GSAS and must contact them directly for admissions materials at 8 Garden Street, Cambridge, MA 02138, 617/495-5315.

Career Outlook The Department of Health Policy and Management has developed an effective job placement mechanism which includes numerous contacts with potential employers on a national scale. A system of faculty networking and professional contacts is used to link students with a broad range of health policy makers and executives. Practitioners are invited to the department to discuss their work and career paths.

Some positions taken by recent graduates include financial manager for a health maintenance organization, administrative director of a primary care center, environmental policy officer for a manufacturing firm, policy analyst for a legislative committee, consultant for an international health organization, product manager for a major corporation, and assistant director of a community health center.

Postgraduate job opportunities in the United States are extremely limited for international students in this country under a student visa. Foreign students therefore should not anticipate working in the United States following completion of their degree program.

For More Information Write to Deputy Director, Academic Programs, Department of Health Policy and Management, HSPH, 677 Huntington Avenue, Boston, MA 02115, or call 617/432-1090.

Department of Health and Social Behavior

Diana Chapman Walsh, Florence Sprague Norman and Laura Smart Norman Professor of Public Health and Chair of the Department

Faculty Professors Cleary, Levine, and Pierce; Senior Lecturer Gortmaker; Associate Professor Sorensen; Assistant Professors Daltroy and Kawachi; Lecturer Wechsler

Adjunct Faculty Lecturers Benfari, DeJong, and Rudd

The Department of Health and Social Behavior trains public health professionals and researchers to apply social and behavioral science theory and methodology to issues in health and illness and to design, implement, and systematically evaluate programs to support health. Teaching and research focus on interpersonal, social, and institutional pressures influencing a variety of health behaviors. Exercise and diet, the use of alcohol, tobacco, and other drugs, intentional and unintentional injury, sexual behavior, and the use of health care services are some examples. Studies identify populations at risk for preventable mortality and disability and seek to specify stages and decisive factors in processes of personal and organizational change. Emphasis is placed on the design and testing of alternative change strategies and their application in a range of social settings (including families, neighborhoods, clinics, community organizations, schools, colleges, places of work, and through the mass communications media).

Current Departmental Research

- Analysis of major social determinants of health
- Design, development, and evaluation of community-based and mass media programs to promote health and prevent drug/alcohol abuse, drunk driving, interpersonal violence, and AIDS/STDs
- Studies of obesity, physical activity, diet, and television viewing among adolescents
- Cancer prevention in the workplace, intervention research in community and occupational settings, prevention of women's cancers
- Social and policy dimensions of attempts to control the use of alcohol, cigarettes, and other drugs
- Epidemiology of alcohol and drug use among adolescents and young adults, in secondary schools, colleges, workplaces
- Design and evaluation of educational programs for people with chronic disease, especially musculoskeletal conditions such as low back pain and arthritis
- Evaluation of interventions to reduce risk of HIV transmission and improve quality of life of HIV-infected persons
- Design, development, and evaluation of intervention programs, protocols, and methods for lifestyle alteration
- Improvement of communication between doctors and patients
- Evaluation of effectiveness of child health services on minority populations and those in poverty
- Statistical evaluation methods used in the social and behavioral sciences and in health promotion interventions
- Analysis of the social dimensions of cardiovascular disease and cancer
- Quality of life as an outcome of health care

Degree Programs Master of Science in Health and Social Behavior, Doctor of Science, and Doctor of Public Health. Please refer to page 13 for information about the Master of Public Health concentration in Public Management and Community Health.

Master's candidates complete course work in areas of health and behavior, health promotion and education, behavioral aspects of health services, behavioral risks to health, and social marketing and social influences on health. Doctoral candidates develop expertise in the application of social science approaches and methods to selected public health problems. Examples of recent student research include risks of teenage childbearing; smoking, alcohol, and drug use among college students; dietary tyrosine, stress, and coping with chronic illness, including HIV infection; school health education; and childhood obesity and physical activity.

Background of Applicants Applicants with a bachelor's degree in a related social and/or behavioral science discipline are generally eligible for the two-year master's program. Applicants with a master's or a doctoral degree may complete the Master of Science degree in one year or in some cases are admitted directly into the doctoral program. All applicants should have relevant work experience.

Career Outlook Positions taken by recent graduates have included university faculty positions at public health and medical schools, and positions directing research and evaluation for a pregnancy prevention program, evaluating initiatives of city and state health departments, designing educational curricula and programs, and designing and managing health promotion activities of HMOs, major corporations, and health consulting firms.

For More Information Write to Dr. Rima Rudd, Director of Educational Programs, Department of Health and Social Behavior, HSPH, 677 Huntington Avenue, Boston, MA 02115, or call 617/432-1135.

Department of Maternal and Child Health

Marie C. McCormick, Professor and Chair of the Department

Faculty Professor Earls; Associate Professors Crocker, Palfrey, and Sachs; Assistant Professors Lieberman, Peterson, Richardson, and Wise; Lecturers Deykin and Gardner

Adjunct Faculty Professors Dwyer, Farrell, and Reiss; Lecturer D. Walker

The goal of the Department of Maternal and Child Health is to improve the health status of mothers and children through basic and applied research, and through involvement in advocacy and community service.

The academic curriculum includes courses on maternal and child health problems of public health significance; the physical, social, and cognitive stages of human development; MCH health services; the role of governmental, private, and voluntary health agencies; relevant research methods; and the methodology of program planning, policy formation, and program evaluation in maternal and child health.

All concentrators in MCH are expected to acquire an understanding of normative growth and development, definition and research in maternal and child health problems, maternal and child health services, the legislation which supports health and social services for mothers and children, and the planning of such services.

Current Departmental Research

- *Infant Mortality and Morbidity* Risk factors for fetal, neonatal, and post-neonatal mortality; methods for confidential perinatal inquiry; outcomes of high-risk infants such as low birth weight infants; efficacy of early intervention; variations in outcome and practice in neonatal intensive care; and evaluation of perinatal interventions
- *Normative Growth and Development* Patterns of growth, maturation, and behavioral, social, and nutritional changes in an aging cohort; the relationship between adult health and child health and development; statistical methodology for analyzing processes of growth and development
- *Special Needs Children* Survey and assessment of Massachusetts health services providing care for children with chronic illness or disability; development of standards of care for children with special health care needs; criteria for assessing proposals to reform the financing of health care
- *High-Risk Youth* Longitudinal studies on the risk factors for delinquency and violent behavior; statistical issues in the use of accelerated longitudinal designs; measurement of biological, psychosocial, and community-level variables in studies of delinquency and violence; characteristics of adolescent suicide completers; co-morbidity among chemically dependent adolescents; manifestation of depression in older adolescents; policies and strategies for preventing high-risk adolescent behaviors; services for children and youth with HIV
- *Nutrition* Epidemiology of child undernutrition in the United States and developing countries; computerized screening of pregnant women at nutritional risk; HIV and breast-feeding
- *MCH Services* Planning and performance of federal, state, and local public health agencies; case studies of planning, policy development, and performance of state Title V agencies

Degree Programs

Master of Science, Doctor of Science, and Doctor of Public Health. Please refer to page 13 for information about the Master of Public Health concentration in Public Management and Community Health with a track in MCH.

Master of Science The master's program is designed for students who wish to focus, in-depth, on maternal and child health. The department offers both a one-year and a two-year program, depending on the background of the student. Candidates for the one-year SM must fulfill at least 20 credits in departmental offerings, and candidates for the two-year SM, at least 30 credits. For MPH students in the MCH track, 12.5 credit units are required. Occasionally, courses offered in other areas of Harvard University may be substituted to meet this requirement.

Dual Master's Degree Program A two-year/two-degree program is available for eligible nurses to study half-time for a Master of Science in Maternal and Child Health at HSPH and half-time for a Master of Science in the Primary Care Program in Parent-Child Nursing at Simmons College. The curriculum prepares nurses for leadership roles in community-oriented primary care for parents and children. Nurses interested in the two-year/two-degree program must apply to, and be accepted by, both the Harvard School of Public Health and Simmons College.

For More Information write to Dr. Jane Gardner in the Department of Maternal and Child Health, or Dr. Maria Bueche, Simmons College, 300 The Fenway, Boston, MA 02115.

Doctor of Science/Doctor of Public Health Doctoral candidates must spend at least two years in residence completing course work leading to a major in MCH and minors in two other fields. Successful completion of the departmental exam and of the school's doctoral qualifying examination permits the student to undertake independent research culminating in a written dissertation.

Background of Applicants Applicants eligible for the one-year SM program are established practitioners or investigators holding prior master's or doctoral degrees in a related field such as medicine, dentistry, nursing, social work, nutrition, physical therapy, psychology, health education, or anthropology.

Applicants eligible for the two-year SM program have either a master's degree in a field unrelated to health (such as law, education, sociology, or statistics) or a bachelor's degree in a health-related field and exceptional, relevant work experience.

Applicants to the two-year/two-degree program hold a bachelor's degree from a program accredited by the National League for Nursing, a license to practice nursing, and the equivalent of at least three years of full-time nursing experience in maternal and child health. International nurses with equivalent backgrounds are also eligible to apply. Applicants must meet the general admissions requirements of both the Harvard School of Public Health and Simmons College.

Applicants to the doctoral programs must have an advanced degree in a health field related to maternal and child health. Applicants are expected to have a sound academic record with documented proficiency in the quantitative sciences, relevant experience, and research interest in an area consonant with the goals of the department.

Career Outlook Graduates of the master's program generally obtain positions in local, state, national, or international health agencies. Some positions taken by recent graduates include planner for the Indo-Chinese refugees' health programs for Rhode Island, director of maternal and child health for New Mexico, director of maternal and child health for the Emirate of Qatar, and nutrition consultant for the United States Public Health Service regional office.

Students completing the doctoral program usually assume academic posts in graduate schools of public health, nursing, social work, and related disciplines. Others assume positions of responsibility in national and international organizations and foundations.

Fellowships A limited number of tuition fellowships may be available to one-year master's degree or MPH candidates who are United States citizens concentrating in the Department of Maternal and Child Health.

For More Information write to Dr. Marie C. McCormick, Department of Maternal and Child Health, HSPH, 677 Huntington Avenue, Boston, MA 02115, or call 617/432-1080.

Department of Molecular and Cellular Toxicology

Armen H. Tashjian, Jr., Professor of Toxicology and Chair of the Department

Faculty Professors Demple and Samson; Associate Professor Schlegel; Assistant Professors Call, Frei, and Schiestl

Adjunct Faculty Associate Professor Marquis; Assistant Professor Farr; Lecturer Ofner

Toxicology is the study of the injurious effects of chemicals. The scope of modern toxicology is broad and depends on the integration of knowledge and techniques from the medical, biological, chemical, and physical sciences. The faculty and staff of the department reflect this multidisciplinary aspect of toxicology.

Current Areas of Research

- Receptor-mediated toxicity
- Tumor promotion
- Biochemical and genetic responses to oxidative stress
- Molecular and genetic toxicology
- Second messenger signalling systems
- Molecular biology of DNA repair and mutagenesis in prokaryotes and eukaryotes
- Development and use of animal and human cell culture models
- Regulation of early mitotic events in mammalian cells
- Molecular mechanisms of LDL oxidation and antioxidant protection
- Genetic recombination and predictive carcinogenesis
- Molecular mechanisms of genetic instability in cancer and aging

Degree Program The Doctor of Philosophy (PhD) is granted by the Faculty of Arts and Sciences at Harvard University via the Division of Medical Sciences.

Application Information For application materials, please contact the Admissions Office, Division of Medical Sciences, Harvard Medical School, 260 Longwood Ave, Boston, MA 02115, 617/432-0162. Note: Completed applications should be returned to Harvard University, Graduate School of Arts and Sciences, Byerly Hall, 2nd Floor, 8 Garden Street, Cambridge, MA 02138 by *January 1st.*

Please pay careful attention to the upper right hand corner of the application form:
Program number: #44 (Medical Sciences Division)
Program name: BPH (Biological Sciences in Public Health)
Subject name: Molecular & Cellular Toxicology
Degree: PhD

The research and training program in toxicology provides students with knowledge of the health implications of environmental chemicals, interactions of toxic agents with diverse cellular systems, biochemical and molecular mechanisms of toxicity, identification of toxic environmental chemicals, and prevention or reversal of adverse effects.

The first year is usually devoted to course work. Students take courses at the Harvard School of Public Health, the Division of Medical Sciences at Harvard Medical School, and other Harvard graduate programs. Appropriate courses may also be taken at MIT. Students are expected to pass a qualifying examination before the end of the fourth semester and to complete thesis research within four to five years of residence.

First-year students have the opportunity to broaden their research skills by rotations in at least three different laboratories for ten weeks each. The laboratory rotation experience is supervised by each laboratory head and enables students to become familiar with a variety of research problems and techniques. At the end of each rotation, students prepare a brief written report and give an oral presentation.

Students participate in journal clubs and weekly laboratory research meetings. Students who are well advanced in their thesis research are encouraged to present their research at appropriate national scientific meetings.

Fellowships A limited number of tuition fellowships and graduate stipends are available for both US citizens and international students.

Background of Applicants Candidates should have a bachelor's degree and demonstrated knowledge of organic, physical, and biological chemistry; general biology; physics; and calculus. A personal interview is strongly encouraged. The Graduate Record Examination is required, and subject tests in one or more of the following areas are strongly encouraged: biochemistry, biology, or chemistry.

Career Outlook Positions taken by recent graduates include postdoctoral research fellowships at academic institutions, junior faculty appointments, and staff positions at federal agencies or industrial laboratories.

For More Information detailing the program and faculty interests, write to Ms. Kathy Silva, Department of Molecular and Cellular Toxicology, 665 Huntington Avenue, Boston, MA 02115, or call 617/432-2286 or FAX 617/432-0377.

Department of Nutrition

Walter C. Willett, Fredrick John Stare Professor of Epidemiology and Nutrition and Chair of the Department

Faculty Professors P. Goldman and Haber; Associate Professors Sacks and Sul; Assistant Professors Ascherio, Frei, Peterson, and Wessling-Resnick; Lecturers Herrera-Acena, Reinhold, and Witschi

The Department of Nutrition provides training and research opportunities in basic science relating to nutrition and in epidemiologic aspects of nutrition as they affect public health. Nutrition policy and the evaluation of nutritional interventions are long-standing interests of the department, particularly as they concern issues in Latin America, Africa, Asia, and the United States. Interests of the department range from molecular biology to human studies of cancer and heart disease. Students learn and use the latest techniques, whether in biochemistry, physiology, biostatistics, or epidemiology, and related fields. Research, whether basic or applied, is relevant to human health.

Current Departmental Research

- Large prospective studies of dietary factors in relation to heart disease and cancer
- Development of methods to assess nutritional status by an analysis of body tissues
- Use of computers for interactive dietary analysis and counseling
- Regulation of cell growth by polypeptide growth factors and the mechanisms of such regulation
- Regulation of cellular metabolism by insulin and nutrients
- Use of state-of-the-art mass spectrometry to study the structure of complex carbohydrates and glycoproteins
- Effects of nutrition programs and methodology on the mental and physical consequences of malnutrition
- The role of oxidants and antioxidants in the pathogenesis of arteriosclerosis
- Regulation of the intracellular delivery of macromolecular nutrients

Degree Programs Doctor of Science and Doctor of Public Health (Epidemiology concentration only), PhD (Biochemistry concentration only)

Areas of Concentration
Nutritional Biochemistry
Epidemiology/International Nutrition

Nutritional Biochemistry The PhD program in nutritional biochemistry trains highly qualified individuals interested in laboratory-oriented approaches to solving nutritional and metabolic problems. Students are required to take graduate courses in biochemistry, physiology, epidemiology, and biostatistics. Students must also take formal course work in two minor fields, one of which must be biochemistry and the other chosen from the other basic medical sciences. Laboratory research is begun at the end of the first year, following rotations in several faculty laboratories.

Epidemiology/International Nutrition Students undertake an SDor DPH program in the Department of Nutrition with emphasis on course work and experience in biostatistics and epidemiology. This program furnishes thorough training in all of these disciplines, enabling graduates to apply sound epidemiological methods to an ever-increasing number of nutritional problems. Students are required to take formal course work in two minor fields, one of which must be epidemiology. Students in a joint program with the Department of Epidemiology must satisfy the course requirements in both departments and must select a minor field acceptable to both departments. The thesis will concern a topic including both nutrition and epidemiology.

Background of Applicants Students with a bachelor's or master's degree may apply for admission to the PhD program in nutritional biochemistry. An excellent background in chemistry, biology, nutrition, or some other relevant scientific discipline is necessary for admission.

Admission to the Doctor of Science or Doctor of Public Health program in nutritional epidemiology requires a strong background in biology and mathematics; an MD or other professional health-related degree is desirable but not required. Admission to a joint program with Epidemiology requires approval of both the Department of Nutrition and the Department of Epidemiology. Applicants to the joint Doctor of Science or Doctor of Public Health program should contact the Department of Nutrition before making formal application.

Admissions Process Applicants to the Nutritional Biochemistry program (PhD) should refer to the entry under the Division of Biological Sciences elsewhere in this catalogue for details on the application process. Applicants to

the Nutritional Epidemiology/International Program (SD or DPH) should refer to the general admissions procedures for the school. Admission materials *must* be obtained from the appropriate office.

NOTE: The deadline for filing PhD applications is January 1st. The deadline for filing SD or DPH applications is January 15th.

Career Outlook Positions taken by recent graduates of the Department of Nutrition include assistant professor of biochemistry at a university, assistant professors and research associates at schools of medicine and schools of public health, postdoctoral research fellows in medical centers and universities, nutrition research director at a major food company, nutritionist at a school of public health, director of nutrition support service in a medical center, community nutritionist for a state health project, local health clinic administrator, food analytical chemist for an industrial firm, nutritionist for a federal nutrition evaluation agency, and nutrition educator for a Tunisian institute.

For More Information Write to the Office of the Chair, Department of Nutrition, HSPH, 665 Huntington Avenue, Boston, MA 02115, or call 617/432-1333.

Department of Population and International Health

Lincoln C. Chen, Taro Takemi Professor of International Health and Chair of the Department

Faculty Professors Alonso, Dyck, J. Harrington, Hill, Levins, Lucas, Mann, Reich, and Salhanick; Visiting Professor Frenk; Associate Professors Berman, Garenne, and Heggenhougen; Assistant Professors Murray, Obermeyer, and Snow; Lecturers Aitken, Cash, J. Walsh, and Wyshak

Adjunct Faculty Professors Caldwell and Hareven; Associate Professor Das Gupta

Faculty affiliated with the Department of Population and International Health are specialists in various disciplines associated with the population field: anthropology, demography, ecology, economics, epidemiology, ethics, nutrition, politics, reproductive biology, and sociology. The department's degree programs prepare students to participate actively in population programs as administrators, researchers, and educators. Course work includes basic and intermediate demography, and provides linkages to other disciplines. Students develop skills in data analysis and information management and evaluation while acquiring a broad perspective on problems and policies in the population field, especially in relation to population dynamics in developing countries. While the population and international health issues of developing countries are given prominence in many of the courses offered, problems of developed countries are also considered.

Degree Programs The department offers a two-year Master of Science (SM) in International Health, and Doctor of Science (SD) and Doctor of Public Health (DPH) degrees. Students with advanced preparation courses are admitted to a one-year Master of Science program. Please refer to page 13 for information about the Master of Public Health concentration in International Health.

The two-year SM degree is based on a common core set of courses which, including the school's requirements, represent about a quarter of the required credits for the SM degree. Students select other courses from the department's offerings and from elsewhere in the school or the university.

The research and teaching interests of the department's faculty comprise four main areas of concentration which serve as organizing groups for doctoral training. Master of Science students are encouraged to select most of their courses in at least three of these four areas (described below).

Areas of Concentration
Demography
Reproductive Health
International Health Policy and Economics
International Health Epidemiology and Ecology
Bio- and Public Health Mathematics

Demography The concentration in demography is designed for students interested in population-based approaches to the study of health and fertility. Students are expected to develop strong technical and substantive skills in demography. These skills include the theory and application of demographic analysis, the social dynamics of fertility and mortality change, and aspects of public policy and interventions. The concentration involves a broad exposure to demographic change within the context of economic development, urbanization, social change, population policies, health interventions, and ethical issues. Areas of special interest in the department are microdemography (demography and anthropology), linkages between demography and biology, longitudinal community-based research approaches to population and

health problems, and monitoring and assessment of intervention programs.

Reproductive Health The core curriculum in this concentration provides the student with knowledge of the physiologic basis of reproduction, the global and regional prevalence of major reproductive health problems, and the determinants and consequences of these problems, including policy and intervention perspectives.

The research direction in reproductive health stresses a combination of laboratory, field-based, and social policy analyses of reproductive health issues. Topics of interest are physiologic adaptations of the human reproductive system to nutrition, physical work, infections, and environmental constraints; the physiology of anovulation; demographic analysis of reproductive risk factors; the relationship between steroid metabolism and reproductive cancer; biologic and social bases of side-effects associated with contraception; women's reproductive health and feminist population policy; and policy analysis and intervention strategies in reproductive health.

International Health Policy and Economics The concentration in international health policy and economics is designed to develop skills and pursue research on health policies and health economics of developing countries, including institutional and political analysis, cost-effectiveness analysis, health financing strategies, project planning and evaluation, and comparative studies. Topics of interest in the department include priority setting for health policy, pharmaceutical policy, health and development policy, health policy affecting public and private sector financing and provisions, and household production of health.

International Health Epidemiology and Ecology International health epidemiology applies and develops the methods of general epidemiology for the planning, implementation, monitoring, and evaluation of health programs in diverse settings in the developing world. Because disease patterns in developing countries are often dominated by infection, parasitic infestations, and malnutrition, the program emphasizes control and prevention measures against these health problems.

Particularly close interdisciplinary collaboration has been developed with epidemiology, human ecology, and molecular biology. These disciplines overlap broadly in the study of infectious and vector-borne diseases, health problems associated with contamination and socioeconomic development, and the health ecology of the workplace.

The international health epidemiology program is aimed at graduate students interested in developing advanced epidemiological capabilities as applied to international health problems. In addition to the Department of Population and International Health, the program taps the support available in the Departments of Epidemiology and Tropical Public Health.

The program encourages specialization in specific areas of epidemiology. The participants acquire basic knowledge and skills in general epidemiology, biostatistics, public health, infectious diseases, and parasitology. The core courses teach epidemiological field methods for developing countries (ID223cd, Maguire), aspects of a global epidemic, AIDS (PIH 242c, Mann), the epidemiological analysis of outbreaks of infectious disease (EPI 214d, Freeman and Platt), and human ecology (PIH 256d, Levins).

Bio- and Public Health Mathematics A Committee on Bio- and Public Health Mathematics advises students, coordinates course offerings, and promotes research and general education in mathematics as applied to scientific problems in public health and medicine.

Members of the committee address a wide variety of health issues and biological problems with mathematical tools. Topics of current research include population dynamics and demography, epidemic models, parasite-host relationship, chemical mutagenesis, compartment models and toxic drugs, fluid dynamics, static and continuum mechanics at both the cellular and organ level, models to assess policy interventions, natural selection and population genetics of pathogens, and diffusion processes under controlled and "natural" conditions.

Students may take a concentration (10 credits) in bio- and public health mathematics. Among the course offerings in the school are BIO 260 (introductory course in mathematical modeling) and PIH 350 (*Complex Systems*). Tutorials on special topics may be taken under the guidance of members of the committee. Courses given in other parts of the university may also fulfill concentration requirements. A seminar on bio- and public health mathematics meets periodically. Interested graduate and postdoctoral students should contact one of the co-chairs, Professor Richard Levins (617/432-1484) or Dr. Tamara Awerbuch (617/432-1056).

Background of Applicants Students in the department come from a variety of backgrounds. Most students have had advanced training in the biological or social sciences or extensive experience in applied fields relevant to population sciences, although some students may have only bachelor's level training in these fields. Many students are from developing countries, and all have an interest in the health of disadvantaged populations worldwide.

Students with bachelor's degrees in biological sciences, social sciences, or other population-related fields generally spend two years in residence toward the master's degree. Admission to the doctoral program is usually preceded by the completion of the SM degree, although candidates with exceptional preparation may be admitted directly to the program.

Career Outlook Some positions taken by recent graduates include head of the directorates of population and epidemiology in ministries of health; consultant on family planning and service delivery in women's health for United Nations' organizations; consultant to the Population Council; consultant to the World Bank; director of population organizations.

For More Information Please turn to the section beginning on page 39 on the department's associated International Health Programs and the Center for Population and Development Studies. For further information about the department, write to the Education Office, Department of Population and International Health, HSPH, 665 Huntington Avenue, Boston, MA 02115, or call 617/432-2253.

Department of Tropical Public Health

John R. David, Richard Pearson Strong Professor of Tropical Public Health and Chair of the Department

Faculty Professors Piessens, Spielman, and Wirth; Associate Professors Harn, Maguire, and Titus; Assistant Professors Barker, Samuelson, and Shoemaker

Adjunct Faculty Professor Monath; Associate Professor Caulfield; Assistant Professor Peattie

Parasitic diseases are a major health problem in the developing world, particularly in tropical regions. In the Department of Tropical Public Health, research and teaching focus on the biological and ecological aspects of protozoan and helminthic diseases, as well as tuberculosis and Lyme disease. The department offers opportunities for basic study of the biology of parasitism and practical work aimed at the development of better tools for diagnosis, vaccines, and control. The program accepts students at the master's, doctoral, and postdoctoral levels.

The program takes a multidisciplinary approach to infectious diseases, using immunology, molecular biology, medical entomology, cell biology and ultrastructure, biochemistry, pathology, and epidemiology. It includes research within the school and field collaborations overseas in Brazil, Venezuela, Colombia, Mexico, Kenya, Sri Lanka, Egypt, Thailand, India, China, and Indonesia.

Current Departmental Research

- Immunology of schistosomiasis, leishmaniasis, filariasis, onchocerciasis, and tuberculosis
- Molecular biology of malaria, schistosomiasis, amoebiasis, giardiasis, tuberculosis, and Lyme disease
- Development of DNA probes to detect infections
- Epidemiology and control of malaria, schistosomiasis, and leishmaniasis
- Public health entomology and ecology of Lyme disease
- Biochemistry, immunology, and pharmacology of insect saliva

Degree Programs Master of Science, Doctor of Philosophy, and Doctor of Science. Please refer to page 13 for information about the Master of Public Health concentration in International Health.

Areas of Concentration

Tropical Public Health
Immunology and Molecular Biology of Parasitic and Other Infections
Vector Biology, Ecology, and Control
Infectious Disease Epidemiology and International Health

Tropical Public Health The basic courses (TPH 201a and PIH-TPH 250b) provide students with a comprehensive understanding of the major parasitic and other infectious diseases, emphasizing epidemiology and control. Other courses deal with various aspects of parasitism, particularly the biology, immunology, molecular biology, vector biology, cell biology, and pathology associated with parasites and their vectors. Although ecological, epidemiological, political, and social aspects relevant to control of infectious agents are integrated into the teaching programs, the focus of the department's research remains primarily in the biological aspects of the host-parasite relationship. Many TPH courses are also integrated into

the International Health concentration in the MPH program, including ID 201cd and ID 223cd.

This program, which normally leads to the Master of Science (SM) degree, provides students trained in the health sciences with the background necessary for research or service careers in developing countries. It introduces them to the significance, recognition, and prevention of the major infectious disease problems of developing countries. Students satisfy basic course requirements in biostatistics, epidemiology, and tropical public health.

Participants take courses in epidemiology, biostatistics, public health, and parasitic and other infectious diseases. This includes courses in epidemiological field methods for developing countries, aspects of the global AIDS epidemic, malaria, and human ecology. The program runs in collaboration with the departments of Population and International Health and Epidemiology.

Immunology and Molecular Biology of Parasitic and Other Infections This program introduces students to recent advances in the biology of parasitic and infectious diseases and provides background for conducting research on these diseases. Emphasis is placed on molecular biology, immunology, and cell biology. In this concentration, the SM degree is usually regarded as preparation for the PhD program. Applicants interested in the doctoral degree must apply through the Division of Biological Studies PhD program.

Students satisfy basic course requirements in tropical public health, biostatistics, and epidemiology and take advanced courses in this department as well as at the Medical School and the Graduate School of Arts and Sciences. Students are expected to enroll in tutorials or to carry out laboratory research projects in addition to their formal course work. The research program emphasizes molecular biology, immunology, cell biology, and the epidemiology of parasites.

Vector Biology, Ecology, and Control This program introduces students to the various arthropod vectors of human infection and develops an appreciation for the biology of these organisms and the means for their control. It prepares students to plan and evaluate control programs and develops skills with respect to identification, maintenance, and experimental procedures involving these organisms.

Students pursuing degrees in Tropical Public Health are required to take TPH 201a, one course in vector biology or epidemiology, and TPH 208cd or TPH 216cd. In addition to required courses in epidemiology and biostatistics, participants in the program take courses in molecular biology, immunology, and parasitology. Depending upon the particular interest of each student, courses in cell biology, invertebrate physiology, pathology, genetics, population ecology, and computer sciences may be required. The research program emphasizes experimental ecology, biochemistry, physiology, and molecular genetics. Applicants with interests primarily in laboratory-based programs should apply through the Division of Biological Sciences PhD program. Those primarily interested in field work or epidemiology should apply to the HSPH Doctor of Science degree program.

Infectious Disease Epidemiology and International Health This program applies and develops the methods of general epidemiology to infectious disease and for the planning, implementation, monitoring, and evaluation of health programs in diverse settings in the developing world. The program emphasizes control and prevention measures and theoretical and practical epidemiologic approaches to solving health problems under resource-constrained circumstances.

Admission Requirements Students in all four programs have at least a bachelor's degree, but can enter at any level of advanced training, including the postdoctoral level. Applicants with a doctoral degree in medicine, dentistry, veterinary medicine, biology, behavioral sciences, other natural and social sciences, law, economics, and engineering, are also considered for admission. Applications to the programs must be received by the school before the January 1 for the PhD degree. Deadlines for admission to the Department of Tropical Public Health is January 15 for both the SD and the SM degrees. Admissions materials for doctoral programs must be acquired from different places depending upon which program/degree is sought. For further information about requesting admissions materials, see the Division of Biological Sciences section of this catalogue.

Career Outlook Recent graduates have taken research faculty positions in universities and in industry, and administrative posts in programs dealing with the control of tropical, parasitic, and vector-borne diseases. Positions are in the public and private sectors and at the national and international levels.

For More Information write to Ms. Kate Eckhaus, Department of Tropical Public Health, HSPH, 665 Huntington Avenue, Boston, MA 02115, or call 617/432-1201.

Division of Biological Sciences

Edgar Haber, Elkan R. Blout Professor of Biological Sciences and Director of the Division of Biological Sciences

Faculty Comprised of faculty from the Departments of Cancer Biology, Environmental Health, Epidemiology, Molecular and Cellular Toxicology, Nutrition, Tropical Public Health, Biostatistics, Population and International Health

The Division of Biological Sciences is an umbrella organization at the School of Public Health. It encompasses the Departments of Cancer Biology, Molecular and Cellular Toxicology, Nutrition, Tropical Public Health, and Environmental Health. The goal of the Division of Biological Sciences at the School of Public Health is to coordinate the teaching and research activities of the constituent departments, especially in the area of graduate study. Members of these departments cooperate in the areas of graduate student admissions and curriculum planning. The division also facilitates the planning of interdepartmental graduate and postdoctoral training grants.

Doctoral Degrees In most departments, two doctoral degrees are offered - the PhD and the SD. Which degree is awarded is dependent upon **all** of these factors: the route of entry with respect to filing an application for admission (as will be described later under *Admissions*); whether the method of investigation centers around laboratory sciences (PhD) or epidemiology/field work (SD); the background of the student (in the Department of Cancer Biology, for instance, those holding clinical degrees in human or veterinary medicine will receive the SD).

Admissions Throughout the Division of Biological Sciences the degree granted depends upon the route of entry when filing an application.

The PhD "Biological Sciences in Public Health" Program (BPH) is offered through the Division of Medical Sciences, Faculty of Arts and Sciences, Harvard University.

Participating departments and programs at the Harvard School of Public Health:

Molecular & Cellular Toxicology All concentrations
Nutrition Nutritional Biochemistry
Cancer Biology Radiobiology and Carcinogenesis, Virology, Immunology (exclusive of applicants holding clinical degrees in human or veterinary medicine)
Tropical Public Health Immunology and Molecular Biology of Parasitic and Other Infections, Tropical Public Health
Environmental Health Physiology program and other programs where the applicant has a significant interest in laboratory versus field work
Interdisciplinary Program in the Biological Sciences This program is designed for applicants who have not as yet identified one of the departments listed above as the site for their thesis research. Upon entry into the Interdisciplinary Program, students pursue a curriculum similar to that sponsored by each of the departments but may delay selection of a specific department until the latter part of their second year of study. Please refer to **Interdisciplinary Program in the Biological Sciences** in this catalog.

Applicants to programs awarding the PhD must request application materials from the Division of Medical Sciences Admissions Office, Harvard Medical School, 260 Longwood Avenue, Boston, MA 02115, 617/432-0162 (for application materials only).

Completed applications for PhD programs are returned to Harvard University, Graduate School of Arts and Sciences, Byerly Hall, 2nd Floor, 8 Garden Street, Cambridge, MA 02138. **The deadline for application to the PhD program is January 1.**

NOTE: Please pay careful attention to the **upper right hand corner of the application form:**

Program number:	**#44**	(Medical Sciences Division)
Program name:	**BPH**	(Biological Sciences in Public Health)
Subject name:	**Nutritional Biochemistry**	(for example)
Degree:	**PhD**	

Applicants to programs awarding the SD must request application materials from, and return completed applications to, the Harvard School of Public Health Admissions Office, 677 Huntington Ave., Kresge Building, G-4F, Boston, MA 02115, 617/432-1030. **The deadline for application to the SD program is January 15.**

For More Information about the programs, contact Ms. Ruth Kenworthy, Administrator, Division of Biological Sciences, Harvard School of Public Health, 665 Huntington Ave., Building II #117, Boston, MA 02115, 617/432-4470

International Health Programs

The International Health Programs seek to promote international health research and education throughout the Harvard School of Public Health. Collaborating academic units include the Departments of Population and International Health, Tropical Public Health, Nutrition, Epidemiology, Maternal and Child Health, and Health Policy and Management. Faculty members who participate in the International Health Programs are drawn from these departments and from various schools throughout the university, and give international health an interdisciplinary orientation. Faculty members have had experience in Latin America, the Caribbean, Africa, Asia, and the Middle East.

Dr. Adetokunbo O. Lucas, Professor of International Health, has major responsibility for the international health concentration of the Master of Public Health degree program, including curriculum review and student admissions criteria. Support for these activities is provided by the Education Office, which also provides services for the Department of Population and International Health. Some programs that are especially linked to the Department of Population and International Health are cited on the following pages.

Takemi Program in International Health

Michael R. Reich, Professor of International Health Policy and Director of the Takemi Program in International Health

The Takemi Program in International Health offers fellowships for research and advanced training on critical issues of international health, especially those related to developing countries. The program addresses problems of mobilizing, allocating, and managing scarce resources to improve health, and of designing strategies for disease control and health promotion. Through its fellowships, the program aims to contribute to institutional development and improvement of national policy in the individual's home country, and to the advancement of general knowledge. The program is named for Dr. Taro Takemi, the distinguished physician-scientist who served for more than 25 years as president of the Japan Medical Association.

The primary goals of research under the Takemi Program are to investigate how resources are allocated for health purposes in both rich and poor countries and to develop methods for making such choices more rational and equitable. The program also strives to promote cooperative research and comparative analysis of health policies and programs in different countries, and to study transnational causes of ill health, such as population migration and disease transmission, and air and water pollution.

Currently, the program's research focuses on a few of the world's most urgent health needs, particularly those of the developing countries, and the most effective ways to meet them. Areas of research have a strong practical emphasis and include the assessment of health technology; the structure, organization, and financing of health care; and the relationships among rapid population growth, increasing pressures on the environment, and health status. In all areas of research, the program emphasizes the social and cultural factors that shape a country's efforts to improve health.

Takemi Fellows carry out specific research projects, using data they bring with them. The projects are closely linked to action programs and to the work Takemi Fellows will do after returning home. Program findings and results are disseminated widely, and opportunities are sought to apply them in various settings.

Fellows also participate in the weekly Takemi Seminar. These seminars examine the question of how to set priorities under conditions of limited resources and evolving technology. The program sponsors several open lectures each year to discuss important issues in international health, to explore possible research themes for the program, and to educate Harvard students and faculty on the state of knowledge and research in international health.

The Takemi Program is not degree-oriented, since course requirements would substantially reduce the time available for research and writing. Upon completion of the program, Takemi Fellows receive a certificate. Takemi Fellowships are generally awarded for ten months. The program offers several fellowships on topics related to maternal and women's health and development in sub-Saharan African countries, through a grant from the Carnegie Corporation of New York. Other Takemi Fellows are supported by external funds raised by each Fellow in cooperation with the program staff.

Background of Applicants Takemi Fellows are highly qualified young and mid-career professionals and scholars from around the world with prior training and experience in public health, medicine, economics, administration, biological science, and other fields.

Harvard Center for Population and Development Studies

Lincoln C. Chen, Taro Takemi Professor of International Health and Director of the Harvard Center for Population and Development Studies

The Harvard Center for Population and Development Studies is a university-wide research center based in Cambridge and managed by the Harvard School of Public Health. Founded in 1964, the Center's primary aim is to advance understanding of world population issues through collaborative research, publications, seminars, and workshops. At present, special attention is being focused on interrelationships among population and international health, natural resources and the environment, and socioeconomic development. The Indian subcontinent and sub-saharan Africa are two areas of primary focus, because these two regions are confronting major population and development challenges.

The center works principally through multidisciplinary groups of faculty, research fellows, and students that focus on specific research themes. Members, research associates, and other participants of the center are drawn from various Harvard faculties, including the schools of public health, arts and sciences, government, design, divinity and education. To promote international cooperation and capacity and development, the center regularly invites visiting scholars from around the world to join in its work. Faculty and students from other universities in the Boston area also participate.

Current activities at the center fall into several broad programs: Health Transitions; the MacArthur Leadership Program; and the Common Security Forum.

Health Transitions

For the past five years, the Health Transitions program has aimed to conduct multidisciplinary research for examining and ultimately strengthening social science contributions to understanding the dynamics of health change around the world. The program's objectives are to review the rapid transitions that are under way in mortality, morbidity, and fertility in developing countries; to examine the relationship of these health and population changes to major social, economic, and cultural transformations in developing societies; and to encourage interdisciplinary dialogue among social scientists, health scientists, public health scientists, and public health experts on the means of improving health.

The program revolves around the Health Transitions research seminar series. Over the past year, the seminars have focused on three major themes: the concepts and measurement of health and human development; social mediation, including cultural and economic aspects, in the process of health change; and the underlying ethics and moral philosophy of health and human survival.

The geographic scope of the research in this program area has been global, although special attention has been on sub-Saharan Africa and India.

MacArthur Leadership Program

The goal of the MacArthur Leadership Program in Population and Development, launched in 1989, is to identify and assist promising young professionals from developing countries and the United States to prepare for leadership roles in the fields of population and development. The program aims to equip young leaders with the tools to analyze and formulate policies concerning not only population change but also socioeconomic development, human rights, scientific and technical change, natural resources and the environment, and health and human welfare.

Each fellow pursues an individually tailored program that combines course work, research and writing, and ongoing research and seminars. Special attention is given to international field travel and to interaction with policy leaders in order to enhance the fellows' understanding of the people, problems, and approaches in population and development.

With support of the MacArthur Program, the center presents several seminar series, as well as a more informal "brown bag" luncheon series where current research issues are discussed by faculty and fellows. In the academic year 1992-93 the seminars have included:

- *Population Policy*: *Gender and Politics* An exploration of contemporary issues with particular emphasis on the gender dimensions of population policy
- *Health Transitions* An ongoing seminar with the goal of strengthening social science contributions to the understanding of the dynamics of health change
- *Family Demography* A review, through case studies of particular populations, of how family factors influence directly and indirectly birth and death rates as well as indices of sickness or good health
- *Livelihoods, Population, and Environment* An examination of the ways in which people marshal physical, human, and sociocultural resources to sustain their livelihoods, and the interactions of these actions with populations and environmental changes

Common Security Forum

The Common Security Forum is an independent international group of public leaders and scholars from Europe, Asia, Africa, and North and Central America, joined together for the purpose of advancing understanding and formulating approaches for encouraging common security worldwide. It includes an international council of political leaders and a research network of scholars and

policy specialists from diverse regions. The forum has three primary objectives:

- *International Dialogue* To promote communication and the exchange of ideas among scholars and decision makers about the nature of future security in a rapidly changing world
- *Research and Analysis* To increase our knowledge and understanding about common security and to stimulate new international reflection and action based on concepts of common security for states, individuals, and groups
- *Policy Development* To advance practical approaches for policies to secure peace and development around the world

The forum's activities will continue over five years and will include study groups on five central themes, annual forum meetings, policy dialogue with an international council of leaders, workshops and commissioned papers, and cooperation with other initiatives pertaining to common security.

A study group on *Human Survival and Security: Health and Population* is concerned with understanding, policy development, and training of humanitarian crisis and security personnel, as well as longer-term issues of global health and population interdependence, including security against new diseases and population interactions with the environment and human rights.

Associated with the Common Security Forum activities is a recently launched project with the Swedish International Development Authority (SIDA). Research will include a review of population policies with a special emphasis on the perspective and role of women; a review of women's perspectives and experiences on fertility in relation to reproductive health, gender equality, and human rights; and a review of the scientific evidence on health, gender equality, and human rights in relation to fertility and reproductive choice in developing countries.

Harvard Institute for International Development

Richard A. Cash, Lecturer on International Health and Institute Fellow

Located in Cambridge, Massachusetts, the Harvard Institute for International Development (HIID) provides technical assistance to developing countries on programs, strategies, and policies that promote health and development. Many of the staff of the HIID Health Office hold joint appointments at HIID and the School of Public Health. These faculty undertake research and teaching related to public health issues. Students may find opportunities to collaborate on HIID activities in Cambridge during the school year through the work-study program. Other students may gain field experience through participation in overseas projects.

Harvard University WHO International Collaborating Center for Health Legislation

William J. Curran, Frances Glessner Lee Professor of Legal Medicine, *Emeritus* and Director of the Harvard University/WHO International Collaborating Center for Health Legislation

The center conducts research and training on a collaborative basis with the World Health Organization in the field of health legislation. The center, the first of its kind in the world, has been involved in international comparative studies in health legislation policy in alcohol and drug dependency treatment, hospital organization and management, and AIDS control, prevention, and treatment. The primary aims of the center are as follows:

- Develop a program of interdisciplinary research and consultation in health legislation
- Establish an educational program on the international aspects of health legislation and policy
- Establish a program of visiting scholars in health legislation
- Aid the Health Legislation Program of the World Health Organization in collecting and distributing information on legislative developments in WHO member states around the world

The center's advisory board includes members from all over the world. The advisory board works with the faculty in developing the research and education programs of the center. For further information on the center's research efforts and the program for visiting scholars, contact the center offices at 677 Huntington Avenue, Boston, MA 02115, or call 617/432-0802, FAX 617/432-4494.

Related Programs

Other international programs of the school are described on page 50 under the François-Xavier Bagnoud Center for Health and Human Rights. These include: International AIDS Program; Global AIDS Policy Coalition; and Health and Human Rights Program.

Interdisciplinary Programs in Health

Postdoctoral Program

John S. Evans, Associate Professor of Environmental Science and Director of Interdisciplinary Programs in Health

The Program in Environmental Health and Public Policy was launched, in 1977, as part of the Interdisciplinary Programs in Health (IPH). Its primary objective is to enlist scholars from the natural and social sciences in finding new ways to deal with the critical environmental problems of today's society. It aims to bring to environmental problems the knowledge, skills, insights, and analytic techniques of a variety of disciplines. Based at the School of Public Health, it is a university-wide program in which members of the faculties of Arts and Sciences, Government, Law, Medicine, and Business participate. It is not a degree-granting program.

The program focuses on the scientific and analytic foundations of environmental decisions. Its aim is to provide a core around which to focus the talents and energies of individuals and groups within the Harvard community on the problems of environmental health and public policy. The central environmental dilemma facing a modern society is that the process of growth and change unavoidably introduces environmental hazards along with benefits. These hazards must be identified, characterized, and evaluated and their relation to the social, economic, and health goals of the society must be analyzed. Decisions must be made and laws and regulations written to mitigate environmental hazards as far as possible while encouraging the development of the society.

Postdoctoral fellowships are awarded for terms of one year and are renewable for a second year. Fellows devote themselves initially to orientation, exploration of opportunities, and selection of projects and advisors. Experimental facilities are available in the laboratories of existing research groups. It is expected that during the term of a fellowship, a substantial investigation or analysis will be completed.

Background of Applicants Fellows are promising graduates of advanced degree programs who seek preparation for careers in which their talents can be applied to environmental health-related problems, either through fundamental or applied research or through service. Fellows are chosen from the natural sciences (chemistry, biology, biochemistry, physics, and mathematics), the quantitative analytic areas (statistics, operations research, engineering, and computer science), and the social sciences (economics, sociology, public policy, law, and management).

Visiting Scientists and Scholars Visitors may be on leave from universities, industry, or public-interest organizations. Applicants should submit a curriculum vitae, a list of publications, a proposal for research or study to be undertaken in IPH, and a statement of the relation of IPH to their career objectives. Stipends may be available, depending on individual circumstances and the availability of other support to the applicant.

Background of Applicants Visitors fall into two general categories: Senior scientists and scholars who have made significant contributions in a discipline and now wish to apply their discipline to environmental health-related problems; and individuals from government, industry, or public-interest organizations who have been involved in problems of environmental health and regulation and wish to broaden their background and perspective.

Interdisciplinary Program in the Biological Sciences

Doctoral Program

The Interdisciplinary Program in the Biological Sciences is a component of Biological Sciences in Public Health described elsewhere in this catalogue under **The Division of Biological Sciences**. It is the goal of this program to attract to the school outstanding students for graduate study in biology as it applies to public health. Students come from a variety of backgrounds but with the common interest of applying their talents to real-world problems. Each student's program consists of establishing a firm foundation in basic biomedical sciences, epidemiology, and biostatistics in addition to specific courses which focus on the student's research interests. Students are required to do three laboratory rotations, in three different research areas, both to aid them in deciding on a doctoral research topic and to provide them with interdisciplinary training.

Degree Requirements Students are registered in the program Biological Sciences in Public Health, which is a component of the Division of Medical Sciences of the Faculty of Arts and Sciences and will receive the PhD degree following the successful completion of their studies. Please review the entry under **The Division of Biological Sciences** elsewhere in this catalogue for details on the application process.

During the first year students have two important components to their formal training: course work and laboratory rotations. A core of required courses providing a firm foundation in biomedical sciences and quantitative analysis has been developed for the division. Students choose an area of concentration and then complete the required curriculum in that area of concentration. The basic courses in biochemistry, cell biology, genetics, and immunology are common for all of the area concentrations, with specialization occurring primarily during the second year of training in which the student takes advanced courses in his/her area of concentration.

Students are required to take ordinal course work which is divided into required courses and recommended electives. All students must demonstrate expertise in the required areas (biochemistry, cell biology, genetics, immunology, biostatistics and epidemiology) either by the successful completion of the required courses or by the demonstration of equivalent knowledge, usually from a previous course. In addition, students take laboratory rotation and required seminar courses.

Toward the end of the second year of study, students select a thesis advisor and a project in one of the following departments: Cancer Biology, Molecular and Cellular Toxicology, Nutrition, Tropical Public Health, or Environmental Health.

Applications to the Division of Biological Sciences are reviewed in a multi-stage process. Applications are directed to review committees composed of faculty qualified to judge the quality of each application. Recommendations are made by departmental committees. Official written notification to selected candidates is from the Graduate School of Arts and Sciences, Harvard University.

Background of Applicants Applicants generally have a bachelor's degree and demonstrated competence in organic and biological chemistry, general biology, physics, and calculus. Applicants deficient in one of these areas may be admitted provisionally on the condition that appropriate courses are taken before and/or after entry. Three letters of evaluation are required from instructors of science and mathematics, and applicants who have worked in relevant areas should also supply letters of evaluation from employers. Applicants wishing to visit the school are encouraged to do so.

Eligible students are provided with two years of financial support (full tuition, stipend, and fees). Thereafter, they are supported by the department or laboratory in which the thesis work is conducted.

Career Outlook The biological sciences have a very positive career outlook, with increasing numbers of tenure-track academic positions becoming available in the 1990s. In addition, there is a large demand from biotechnology companies and pharmaceutical organizations for people with divisional training.

For More Information Write to Ms. Ruth Kenworthy, Division of Biological Sciences, Harvard School of Public Health, 665 Huntington Ave., Building 2-#117, Boston, MA 02115, or call 617/432-4470

Minority Postdoctoral Fellowship Program

Postdoctoral Program

Cassandra A. Simmons, Assistant Dean for Students and Director of the Minority Postdoctoral Fellowship Program

The Minority Postdoctoral Fellowship Program provides a bridge between academic training in public health disciplines and entry-level faculty positions for members of underrepresented minority groups. The program gives participating fellows the opportunity for development as scholars and independent researchers, and provides a competitive stipend.

The school recognizes that mentoring is a crucial component in the evolution of scholars to academicians. Accordingly, each fellow works closely with a mentor, an experienced faculty member in his or her area of interest, who can foster and guide research development by providing critical review of research findings and manuscripts, by extending the opportunity to present scientific work at national meetings, and by providing contacts with colleagues within the university and at other institutions. Mentors help develop fellows' teaching abilities by providing the opportunity to lecture in courses and guidance in curriculum development and pedagogic methods. Finally, mentors serve as resources for the development of grant proposals and the promotion of funding activities.

Optimally, fellows complete the program in two years (although appointments may be extended to three), having established an independent research agenda, having

published papers in peer-reviewed journals, having obtained independent grant support, and having gained sufficient teaching experience to develop their own courses. Fellows also participate in a variety of other activities designed to involve them fully in the formal and informal life of the academic community.

Background of Applicants Candidates for this program are American citizens or permanent residents of one of the minority groups (Black, Hispanic, and Native American) considered to be underrepresented in the faculty ranks. All applicants must hold an earned doctoral degree. Since the Harvard School of Public Health is multidisciplinary, candidates with a variety of appropriate specialties are encouraged to apply. Applicants must have a background and career goals which are relevant to one of the programs or departments within the school.

For More Information call Dr. Cassandra A. Simmons, Director of the Minority Postdoctoral Fellowship Program, at 617/432-1036.

Postdoctoral Fellowships in Health Services Research

Milton C. Weinstein, Henry J. Kaiser Professor of Health Policy and Management and Director of the Program in Health Services Research

A small number of Postdoctoral Fellowships in Health Services Research are available to physicians and dentists who wish to develop the skills necessary to become independent researchers through a competitive application process. Areas of interest include quality of medical care, technology assessment and cost-effectiveness, health care policy (financing, physician payment, manpower, access to care), management of health care organizations, and AIDS policy. The application deadline falls in October for a fellowship beginning the following July.

The program emphasizes methodology in evaluation research, decision science, economics, and organizational analysis, and permits fellows to design an individualized program that combines coursework, tutorials under the supervision of Harvard faculty, and research experience. Fellows may also elect to apply for admission to a formal degree program at the master's or doctoral level. The fellowship term is ordinarily two years, and pays an annual stipend based on the number of years of relevant experience after completing the MD or equivalent degree. Funds are also available to cover tuition and research-related expenses. Fellows interested in combining their fellowship with a degree program at the School of Public Health must also complete an application for admission, meet all admissions requirements, and submit their application to the admissions office of the Harvard School of Public Health by the posted deadline date.

Background of Applicants Candidates for the fellowship must hold an MD, DDS, or equivalent degree, and must be a US citizen or permanent resident. The fellowship application consists of a curriculum vitae, three letters of reference, and a two-page statement describing career goals, research interests, and reasons for applying.

For More Information write Deputy Director, Academic Programs, Department of Health Policy and Management, Harvard School of Public Health, 677 Huntington Avenue, Boston, MA 02115, or call 617/432-1090.

Training Program in Psychiatric Epidemiology and Biostatistics

Doctoral and Postdoctoral Programs

Ming T. Tsuang, Professor of Epidemiology and Psychiatry and Program Director, and Nan M. Laird, Henry Pickering Walcott Professor of Biostatistics and Program Co-Director

The program provides doctoral and postdoctoral training in epidemiologic and statistical methods as applied to the study of psychiatric disorders. A limited number of fellowships funded by the National Institute of Mental Health (NIMH) are available that cover tuition expenses and pay an annual stipend commensurate with prior education and related experience. The program is jointly administered by the Departments of Epidemiology and Biostatistics.

Psychiatric Epidemiology Concentration Training is provided in both population-based and clinical epidemiologic investigations of the etiology of psychiatric disorders. The primary emphasis is on the study of the origins, course, and outcomes of psychiatric disorders. Students may also receive specialized training in the areas of psychiatric genetic epidemiology, developmental psychiatric epidemiology, psychosocial epidemiology, clinical psychiatric epidemiology, and pharmacoepidemiology.

Psychiatric Biostatistics Concentration Training is provided in probability theory and applications, statistical inference, regression analysis, analysis of variance, log-linear models and multivariate analysis of quantitative data. Students are encouraged to take courses of particular importance for psychiatric investigations, such as survival analysis, clinical trials, longitudinal data analysis, and to complete a minor in psychiatric epidemiology. Students participate in relevant working seminars and are required to engage in a summer internship under the supervision of faculty in psychiatric epidemiology and biostatistics.

Background of Candidates and Degree Options NIMH training fellowships may only be awarded to US citizens or permanent residents. Trainees typically hold degrees in medicine, biological or social sciences, or quantitative methods. Prior research experience is also recommended. Candidates may apply for SM, SD, and DPH degrees either in epidemiology or biostatistics; only postdoctoral candidates are eligible for the SM degree in this program. Degree candidates must fulfill general requirements in either epidemiology or biostatistics and must complete substantive course work in psychiatric epidemiology. Nondegree postdoctoral fellowships are also available, offering supervised research opportunities in ongoing, faculty-sponsored projects.

Application Procedures Applicants to degree programs must be accepted by the HSPH Committee on Admissions and Degrees before they can be considered for an NIMH training fellowship. All degree program applicants should indicate their interest in the Training Program in Psychiatric Epidemiology and Biostatistics in their application essay. Individuals interested in non-degree postdoctoral fellowships should send a letter describing current research interests, together with a curriculum vitae, three letters of recommendation, and one or more representative publications to Ms. Mary Anne Zani at the address listed below. Members of minority groups are especially encouraged to apply.

For More Information contact Ms. Mary Ann Zani, Harvard Training Program in Psychiatric Epidemiology and Biostatistics, HSPH, 677 Huntington Avenue, Boston, MA 02115, or call 617/432-1055; FAX: 617/566-7805.

Postdoctoral Training Fellowships in Biostatistics

Postdoctoral Programs
Marcello Pagano, Professor of Statistical Computing (Director of AIDS Program), Louise Ryan, Associate Professor of Biostatistics (Director of Environmental Health Program), and Marvin Zelen, Professor of Statistical Science (Director of Cancer Program)

The Department of Biostatistics has postdoctoral fellowships available for biostatistical training in the areas of AIDS, cancer, and environmental health (see also preceding program in psychiatric biostatistics).

Background of Applicants Applicants must have a doctoral degree in biostatistics, statistics, or a related discipline and an interest in the development and application of statistical methods for biomedical research. Postdoctoral appointments are funded through a variety of research and training grants, including training grants from the National Institutes of Health, oriented toward research on cancer, the environment, and AIDS. Recipients of NIH traineeships must be US citizens or permanent residents.

Postdoctoral Quantitative Training in HIV-Related Diseases This program is offered jointly with the Department of Epidemiology. It is aimed at postdoctoral students who are interested in biostatistical and epidemiological research directed against the AIDS epidemic. It concentrates on training in the study of the mechanisms for transmission of the virus and the planning and analysis of AIDS clinical trials.

Collaborations with units at Children's Hospital, Brigham and Women's Hospital, Beth Israel Hospital, and Boston City Hospital provide access to data on drugs and HIV infection in mothers and infants. Additional opportunities for collaboration come through epidemiological studies in New York City, Italy, Mexico, Greece, and Japan, as well as the Department of Biostatistics' statistical and data coordinating center for hospital-based AIDS clinical trials. Among the methodological research areas under current investigation are techniques associated with censored survival models, planning and analysis of AIDS clinical trials, models for predicting the future course of the AIDS epidemic, computer models to assess the impact of interventions to prevent or slow down the incidence of AIDS (for example, clean needle programs), and modification of existing methods when data is collected at irregular intervals. Applicants for this program may also hold a doctorate in epidemiology.

Postdoctoral Training in Environmental Biostatistics:
This program is designed for postdoctoral students who wish to pursue statistical and environmental research addressing effects of the environment on human health. Fellows participate in at least one interdisciplinary environmental research project. Current research areas at the school include environmental epidemiology, exposure assessment, developmental toxicity, occupational health, carcinogenesis, and risk assessment. Faculty in the department work with the school's Kresge Center for Environmental Health, which enables fellows to be involved in emerging research activities. Fellows also participate in ongoing statistical research addressing environmental problems and are encouraged to develop independent research programs. Relevant areas of current methodological research in the department include measurement error models, longitudinal studies, statistical methods for developmental studies, analysis of correlated binary data, analysis of spatially distributed observations, Bayesian methods, and meta-analysis.

Postdoctoral Training in Cancer Biostatistics
Postdoctoral fellows supported by the cancer biostatistics training grant are geographically located within the Division of Biostatistics at the Dana-Farber Cancer Institute. The division carries out a broad program in interdisciplinary collaborations with clinical and basic scientists, as well as research on statistical methodology. There is special emphasis on multi-center clinical trials. The close interaction with cancer research serves to generate many new theoretical problems in statistics. Among the areas of current methodological research are survival distributions (counting processes, modeling, regression methods with partially missing data, surrogate markers), bioassay, models for carcinogenesis, models describing the quality of life from clinical trials, theory of repeated measures, group sequential methods, planning of studies with misclassification errors, and optimal scheduling of diagnostic examinations.

Program in Human Ecology

Special Doctoral Program
Richard Levins, John Rock Professor of Population Sciences and Head of the Program in Human Ecology

The study of human ecology in a public health context integrates social, historical, and ecological aspects of human existence in order to understand and influence the improvement of health in populations and communities. The Program in Human Ecology is an interdepartmental research and teaching program including faculty from the Department of Population and International Health and other areas. The program emphasizes the inseparability of biological and social components and the patterns of health and disease, agriculture, environmental protection, and resource use within a framework of complex system analysis.

Degree candidates usually take further training in quantitative and qualitative mathematical approaches to complex systems, general and human ecology, and demography. Advanced courses relevant to each student's research interests are available as electives. These might include agricultural systems and production, population ecology, ecological anthropology, specialized courses in tropical public health, environmental sciences, and biology.

Background of Applicants Applicants are accepted into a doctoral program in one of the school's departments and must meet that department's admission and degree requirements and those of the Program in Human Ecology. Potential applicants should contact Dr. Levins to indicate their interest in being considered for the program.

Public Health for Dentists

Special Master's Program
Chester W. Douglass, Lecturer on Public Health Dentistry and Head of the Department of Dental Care Administration, Harvard School of Dental Medicine

Dentists enroll in many of the degree programs at the Harvard School of Public Health, particularly in the Master of Public Health program. The school cooperates with the Harvard School of Dental Medicine to offer a three-year postdoctoral fellowship program which leads to a public health degree and dental specialty certificate, as described below.

Postdoctoral Fellowship Program in Dental Public Health, Epidemiology, and Dental Care Administration
This program prepares individuals for creative full-time teaching, research, and administrative careers in dental public health, epidemiology, and dental care administration. Participants in the program are appointed as Clinical or Research Fellows in Dental Care Administration at the School of Dental Medicine.

The program comprises three parts of approximately one year each. One part of the program involves a formal course of study leading to a Master of Science or Master of Public Health degree. Fellows must complete the core courses in the first year at the Harvard School of Public Health and must complete all requirements for the degree within two academic years. Candidates with an equivalent degree from another school, however, may be accepted into the program with one year advanced standing.

The second portion of the program involves a one-year supervised residency at the community, state, or national level in epidemiology or health policy and administration. This residency meets the requirements of the American Board of Dental Public Health. The third portion affords opportunity for advanced study and research at the Harvard Schools of Dental Medicine and Public Health, at other Harvard schools, and at other institutions.

Fellows may carry on epidemiological or health services research over the entire three-year period in a variety of situations involving either new or continued studies. Each participant in the program prepares a research thesis for presentation at the end of the third year.

In addition to the master's degree, candidates receive a certificate of completion of residency requirements from the Harvard School of Dental Medicine. Doctoral programs specifically designed for dentists in oral epidemiology or health policy and management are available for fourth- and fifth-year fellows.

Background of Applicants The postdoctoral fellowship program is open to dentists and other qualified health professionals who meet the admission requirements of both participating schools. Application should be made to the School of Dental Medicine, whose Committee on Postdoctoral Education will forward the applicant's file to the School of Public Health for consideration.

Joint HSDM/HSPH Oral Epidemiology Training Program

Special Doctoral Program
The purpose of this program is to prepare dentists and others interested in oral disease for research and teaching careers in epidemiology with an emphasis on oral epidemiology and dental health. Doctoral students follow the required curriculum in epidemiology with additional course work in oral biology and the epidemiology of oral and dental diseases.

Students are required to participate in field research activities, case control studies of oral health risk factors, and clinical trials assigned to test preventive, diagnostic, or therapeutic interventions. Graduates are expected to pursue research careers in the field of oral epidemiology in universities, private research centers, or government agencies.

Applicants must be dentists or other health professionals with a specific interest in the field of oral epidemiology. Funding is available for United States citizens or permanent residents. Women and minority dentists are encouraged to apply. The program is jointly administered with the Department of Dental Care Administration in the Harvard School of Dental Medicine and the Department of Epidemiology at the School of Public Health.

For More Information write to Dr. Chester Douglass, Harvard School of Dental Medicine, 188 Longwood Avenue, Boston, MA 02115.

Program in Clinical Effectiveness

Special Master's Program Affiliated with the Brigham and Women's Hospital
Research Training Program in Clinical Effectiveness
Howard H. Hiatt, Professor of Medicine and Lee Goldman, Professor of Medicine, Co-Directors of the Program in Clinical Effectiveness

The Program in Clinical Effectiveness is intended for physicians who have completed their residencies and wish to obtain the quantitative and analytical skills needed for careers in clinical research. Students in this program attend an intensive eight- week, 15-credit summer program, comprising courses in biostatistics, epidemiology, and health policy and management. Upon completion of the summer program, qualified participants may apply these academic credits towards the requirements for either a Master of Public Health or Master of Science degree.

Two degree programs that are specifically designed for students in this field are the Master of Public Health with a concentration in Clinical Effectiveness (see page 13), and the Master of Science in Epidemiology with a concentration in Clinical Epidemiology (see page 23). Qualified participants unable to attend class during the regular academic year may fulfill requirements for the Clinical Epidemiology degree program by attending classes during a second or a third summer period and by completing a supervised research project.

Background of Applicants Candidates must be fellows or faculty members and must be sponsored by their clinical departments or divisions.

For More Information and application materials write to Dr. E. Francis Cook, Division of Clinical Epidemiology, Brigham and Women's Hospital, 75 Francis Street, Boston, MA 02115, or call 617/732-5650.

Epidemiology Research Traineeships

Traineeship Programs
Julie Buring, Associate Professor of Ambulatory Care and Prevention, and Charles Hennekens, Professor of Medicine and Ambulatory Care and Prevention, Co-Directors of the Epidemiology Research Traineeship Programs in Cardiovascular Disease and Aging

These programs aim to prepare individuals for research and teaching careers in epidemiology, with particular emphasis on cardiovascular disease or aging. Formal course work is supplemented with seminars and tutorials, and with field activities under the supervision of a preceptor. Opportunities for field activities include design, conduct, and analysis of case-control and cohort studies, randomized clinical trials, and community surveys.

Background of Applicants Candidates must be United States citizens or permanent residents who are enrolled in a degree program in epidemiology at the Harvard School of Public Health. Members of minority groups are particularly encouraged to apply.

For More Information write to Dr. Buring or Dr. Hennekens at 900 Commonwealth Avenue East, Boston, MA 02215, or call 617/732-4965.

Cancer Epidemiology Research Traineeship

Traineeship Program
Nancy Mueller, Professor of Epidemiology and Director of the Cancer Epidemiology Research Fellowship Program

The purpose of this program is to prepare individuals for research and teaching careers in epidemiology, with an emphasis on cancer. Students follow the curriculum in epidemiology with additional coursework in the epidemiology and biology of cancer. Students who are completing a doctoral degree are expected to focus their research on cancer under the guidance of a faculty member participating in the program.

Background of Applicants Candidates must be United States citizens or permanent residents who are enrolled in a degree program or postdoctoral fellowship program in epidemiology at the Harvard School of Public Health. Priority is given to doctoral degree candidates. Members of minority groups are particularly encouraged to apply.

For More Information write to Dr. Mueller at the Department of Epidemiology, HSPH, 677 Huntington Avenue, Boston, MA 02115, or call 617/432-4576.

Comprehensive Educational Program in Cancer Prevention

Doctoral and Postdoctoral Program
Graham Colditz, Associate Professor of Epidemiology (Curriculum Coordinator), Frederick P. Li, Professor of Epidemiology and Director of the DFCI Division of Cancer Epidemiology and Control (Co-Director), Glorian Sorensen, Associate Professor of Health and Social Behavior and Director of Community-Based Programs at DFCI's Division of Cancer Epidemiology and Control (Placement Coordinator), Diana Chapman Walsh, Professor and Chair of Health and Social Behavior (Co-Director), Walter Willett, Professor of Epidemiology and Nutrition and Chair of the Department of Nutrition (Co-Director and Principal Investigator).

Administered jointly by the Harvard School of Public Health and the Dana-Farber Cancer Institute, this program is funded by the National Cancer Institute and pro-

vides doctoral and postdoctoral training in the social, behavioral, and epidemiological factors associated with cancer prevention. A limited number of fellowships that cover tuition expenses and provide a stipend are available to doctoral students, physicians enrolled in a one-year master's program, and postdoctoral fellows.

The program draws on teaching, scientific research, and field activities of HSPH, clinical resources of DFCI, and the shared laboratory and scientific facilities of both institutions to form the basis for a comprehensive education program in cancer prevention and control. The curriculum consists of course work, a seminar series, and colloquia. All fellows enroll in a specially developed core course in the "a" period (September - November), which covers the breadth of cancer prevention. Subsequent course work is selected from diverse course offerings within Harvard and area schools. Field/clinical/lab placements are available in participating sites and institutional settings around the Boston area. Original research is required of all fellows earning doctoral degrees and is supervised by teaching faculty engaged in ongoing projects.

Background of Applicants Candidates for the doctoral program must hold a master's degree in public health. Those applying to postdoctoral positions must hold an MD, PhD, or equivalent degree. All applicants must be US citizens or permanent residents and have a demonstrated interest in the area of cancer prevention. Members of minority groups are particularly encouraged to apply.

Application Procedures Application forms may be obtained from the address below. In addition, candidates must submit transcripts of grades, GRE scores, and three letters of reference. Applicants to degree programs must also be accepted by the HSPH Committee on Admissions and Degrees. All applicants are required to have an interview.

For More Information write Ms. Loretta LaFratta or Ms. Mary Kate Newell, Department of Health and Social Behavior, Harvard School of Public Health, 677 Huntington Avenue, Boston, MA 02115, or call 617/432-1135.

Environmental Epidemiology Research Traineeship

Traineeship Program
Richard Monson, Professor of Epidemiology, Director of Environmental Epidemiology Fellowship Program

The purpose of this program is to prepare individuals for research and teaching careers in environmental and/or occupational epidemiology. Trainees take courses in epidemiology, environmental health, and/or occupational health. They are expected to focus their research on issues relating to diseases of environmental or occupational origin. Postdoctoral fellows with an interest in environmental and/or occupational health are eligible to be considered for support from this program.

Background of Applicants Candidates must be United States citizens or permanent residents who are enrolled in a doctoral degree program or postdoctoral fellowship program in epidemiology, environmental health, or occupational health. Members of minority groups are particularly encouraged to apply.

For More Information write to Dr. Monson at the Department of Epidemiology, HSPH, 677 Huntington Avenue, Boston, MA 02115, or call 617/432-4587.

Harvard AIDS Institute

Myron E. Essex, Mary Woodard Lasker Professor of Health Sciences and Chair of the Harvard AIDS Institute; Richard G. Marlink, Executive Director of the Harvard AIDS Institute

The Harvard AIDS Institute was established in 1988 as a response to the social and medical challenges of the AIDS pandemic. The institute facilitates communication and collaboration among researchers at Harvard University and beyond to help fulfill its principal goals:

- To promote research that enhances understanding of HIV prevention, transmission, diagnosis, and treatment
- To advance AIDS education on local, national, and international levels
- To provide multidisciplinary AIDS training to scientists and clinicians throughout the world
- To stimulate the development of policies and solutions that benefit those affected by the HIV epidemic

A full range of inquiry into AIDS, from biological to behavioral research, is under way. The institute has launched a number of programs to complement this research and has developed or helped to facilitate a number of AIDS meetings aimed at enhancing international collaboration. These include the VIII International Conference on AIDS (Amsterdam, July 1992), the Second International Taipei AIDS Conference (Taiwan, May 1992), and the VI International Conference on AIDS in Africa (Dakar, December 1991). At the XI International Conference on AIDS, held in Berlin in June 1993, the institute sponsored an AIDS clinical research symposium on antiviral treatment issues that was broadcast live around the world. The institute also sponsors national and local speakers' series, forums, and symposia on critical issues in AIDS research, policy, and clinical care.

The institute disseminates information through a number of publications, including *The AIDS Report*, a quarterly journal that features recent research advances, and the *Harvard AIDS Letter*, a monthly publication that provides information about AIDS programs, research opportunities, funding sources, and events. The institute has sponsored production of a number of films, including *HIV, Travel and the Law*, *Une Conversation*, and *AIDS in Taiwan*.

Through the Fogarty Program for International Training in AIDS-Related Epidemiology, the institute trains biomedical researchers and health care workers from developing countries in basic laboratory and epidemiological research techniques. Workshops in the United States and in partner countries augment this training effort. The institute also manages several national AIDS training programs to prepare the next generation of US investigators to lead AIDS research projects. These include the US Medical Students' AIDS Training Program for minority medical students and two postdoctoral fellowship programs: the Multidisciplinary AIDS Training Program and the Program for AIDS Clinical Research Training. Finally, the institute participates in the HIV Curriculum Project, which integrates AIDS-related issues into the innovative, problem-based curriculum of Harvard Medical School to enable students to handle with sensitivity the social and personal issues raised by the epidemic and to keep abreast of the rapid changes in the science of HIV.

The François-Xavier Bagnoud Center for Health and Human Rights

Jonathan M. Mann, François-Xavier Bagnoud Professor of Health and Human Rights, Professor of Epidemiology and International Health, and Director of the François-Xavier Bagnoud Center for Health and Human Rights

The François-Xavier Bagnoud Center for Health and Human Rights was founded in 1993 to promote physical, mental, and social well-being through focused attention to the relationship between health and human rights. The center links the principles and practice of modern public health and modern human rights through its research, teaching, and service activities in Boston, the United States, and throughout the world. The center's priorities include the health effects of human rights violations, evolving concepts of public health practice as related to human rights, and advancing understanding about the fundamental and inextricable relationships between public health goals and promotion of human rights and dignity. Special attention is given to children's rights and to the ongoing challenges of the HIV/AIDS pandemic. The center collaborates with nongovernmental organizations, governmental and intergovernmental agencies and academic institutions.

International AIDS Program

The center's International AIDS Program was created to mobilize resources for multidisciplinary research on AIDS in developing countries and to strengthen exchanges between AIDS investigators at Harvard and in developing countries. Priority areas for International AIDS Program work include AIDS and human rights; the role of community-based, nongovernmental organizations; women and AIDS; detection and evaluation of innovations in HIV/AIDS prevention; examination of interactions between HIV/AIDS programs, STD programs, and primary health care programs; the political economy of

the manufacture, distribution, and availability of diagnostic tests, therapeutic drugs, and vaccines; and the recognition of and response to new pandemics.

The Global AIDS Policy Coalition

The International AIDS Program houses the secretariat of the Global AIDS Policy Coalition, an international research and advocacy group which brings together scientists, activists, clinicians, people with HIV, and service providers. The coalition identifies and tracks trends in the global HIV/AIDS pandemic, provides independent evaluation and policy analysis, and promotes international information exchange in order to strengthen existing HIV/AIDS programs. In late 1992 the coalition prepared a comprehensive report on the global epidemic and response which was published by Harvard University Press as *AIDS in the World.* Research activities are currently being organized by the coalition in all of the International AIDS Program's priority areas. Coalition activities are supported by the François-Xavier Bagnoud Association.

The Health and Human Rights Program

The Health and Human Rights Program's location at the Harvard School of Public Health will serve to expand human rights "literacy" among health care professionals and scientists by introducing concepts of human rights into the school's full range of educational and training programs. In this way the François-Xavier Bagnoud Center for Health and Human Rights will help to train new generations of public health leaders able to make innovative and creative contributions to global health.

The Health and Human Rights Program sponsors visiting fellows who pursue research into specific relations between public health and human rights and who will share their knowledge to help broaden the general understanding among human rights and health care professionals. The Health and Human Rights Program will publish the *International Journal of Health and Human Rights*, with its first quarterly issue appearing in the winter of 1993. The *Journal* will be distributed internationally. The Health and Human Rights Program serves as a bridge between the health community and the human rights community and will host meetings, a speaker series, and public forums to encourage communication and collaboration.

Center for Health Communication

Jay A. Winsten, Associate Dean for Public and Community Affairs and Director of the Center for Health Communication

A key challenge facing health professionals is to mobilize the immense power of mass communication to empower individuals to adopt healthy behaviors, direct policy makers' attention to important but neglected health issues, and frame those issues for public debate and resolution.

To address this challenge, the Center for Health Communication is developing a new field of endeavor in academic public health, namely, mass communication and health. This is accomplished by:

- Conducting and publishing research and analysis documenting the contributions of mass communication to behavior change and policy
- Designing and implementing graduate course work, in collaboration with the academic departments, to prepare future health leaders to utilize effective communication strategies
- Creating programs to strengthen communication and understanding between journalists and health professionals

The best known of the center's efforts is the Harvard Alcohol Project, which demonstrated how a new social concept — the designated driver — could be rapidly introduced through mass communication, promoting a new social norm that the driver does not drink. The project represents the first large-scale effort to incorporate health messages within the dialogue of Hollywood scripts.

Another initiative launched by the center is Operation Breakthrough, a mass communication program that focuses on problems affecting teens with the aim of bringing interpersonal interventions by family and friends into the realm of socially normative behavior. Issues that have been addressed include teen alcohol abuse, smoking, other substance abuse, and eating disorders.

The Harvard Domestic Violence Project seeks to deepen public understanding of domestic violence and ways to prevent it; raise family violence issues to higher priority on the public agenda; and contribute to the development and implementation of effective public policies.

The center sponsors the Harvard Journalism Fellowship for Advanced Studies in Public Health, which provides opportunities for journalists to examine critical issues in public health through a combination of structured, problem-oriented seminars and self-directed study.

The center also sponsors the Harvard Nutrition and Fitness Project, which serves as a nationwide resource for journalists concerned with family health and diet, and sponsors the Harvard Health Forum, a series of working luncheons in New York City for magazine writers and editors.

Center for the Prevention of Cardiovascular Disease

Edgar Haber, Elkan R. Blout Professor of Biological Sciences and Director of the Center for the Prevention of Cardiovascular Disease

The Center for the Prevention of Cardiovascular Disease was established during the 1991-92 academic year to foster interdisciplinary research on cardiovascular disease and its prevention. Occlusion of a vital artery, either in the heart or the brain, is the principal cause of death in developed countries. The antecedent of vascular occlusion is arteriosclerosis, a long-term process that often begins early in the lives of most inhabitants of developed countries. The progress of arteriosclerosis varies among individuals, depending on genetic factors, controllable risk factors such as diet, hypertension, and smoking, and uncontrollable factors such as diabetes mellitus. A long-term goal of the center is to establish research teams that investigate the biological and behavioral contributors to heart disease and suggest health policy measures that support its prevention.

In its initial phase of development, however, the center's effort has been directed solely at identifying the biological factors that lead to vascular occlusion. Thus, in June 1992, the Cardiovascular Biology Laboratory was established by Dr. Edgar Haber to discover the molecular and cellular events that lead to arterial occlusion and to identify specific targets for intervention. Four research teams, consisting of faculty, postdoctoral fellows, graduate students, and technicians, are working on a variety of subjects that can be broadly categorized as *studies in arterial occlusion: atherosclerosis and thrombosis*. *Studies in atherosclerosis* seek to examine the contribution that cellular proliferation and migration in the arterial wall make in the genesis of arteriosclerosis and to identify innovative methods of arresting the process by selective inhibition of genes or gene products that control cellular proliferation. *Studies in thrombosis* seek to dissect the thrombotic process utilizing methods of immunology and molecular and cellular biology to determine which reactions are most susceptible to intervention from both a preventive and therapeutic orientation.

Center for Quality of Care Research and Education (QCaRE)

R. Heather Palmer, Lecturer on Health Services and Director of the Center for Quality of Care Research and Education (QCaRE)

Over the past decade, health care policy has been dominated by issues of cost containment and access to health care. It is widely recognized that cost and access concerns cannot be adequately addressed without also dealing with the issue of quality of care, and measurement and improvement of quality are expected to be an essential component of health care reform in the United States.

QCaRE conducts research on quality of care and sponsors a weekly quality of care research seminar series. Faculty members affiliated with QCaRE also teach in the Department of Health Policy and Management degree programs, promote student thesis work and postdoctoral research on quality of care, and work to establish partnerships with health care institutions, agencies, and organizations involved in the measurement and improvement of health care quality. Students interested in quality of care should consider taking the following courses: HPM 256c, HPM 257c, HPM 258d, and HPM 259d.

QCaRE's current research includes two major interdisciplinary multi-site projects. The PROSPER project, "Patient Reports on System Performance," is a collaborative project with the Harvard Community Health Plan and the Henry Ford Health System in Detroit. It involves development and assessment of the validity of patients' reports on the performance of clinical management systems. The DEMPAQ project, "Project to Develop and Evaluate Methods for Promoting Ambulatory Care Quality," is directed at developing methods for the Health Care Financing Administration's physician peer review organizations to use in promoting quality of care in physicians' offices. QCaRE is leading this collaborative effort with researchers from the Johns Hopkins School of Hygiene and Public Health and the Park Nicollet Medical Foundation in Minneapolis. The demonstration is occurring in three states: Alabama, Iowa, and Maryland. QCaRE is also active in methods for translating practice guidelines into review criteria, performance measures and standards of quality, and in the selection of quality measures for a "report card" on managed care organizations.

Center for Risk Analysis

John D. Graham, Professor of Policy and Decision Sciences and Director of the Center for Risk Analysis

The mission of the Harvard Center for Risk Analysis is to foster a reasoned public response to health and safety hazards that arise from industrial and commercial activities. Major problem areas include consumer and worker exposures to toxic chemicals, community exposures to air and water pollution from factories, agricultural pesti-

cide residues in drinking water, drug and food safety, and residential exposures to asbestos, lead, and radon.

The center defines "risk analysis" broadly to include the interrelated tasks of risk assessment, risk evaluation, risk management, and risk communication. Major center activities include research stimulation, curriculum development, the facilitation of risk communication, and public policy analysis. Many of these activities are conducted collaboratively with professionals from business, labor, government agencies, and public-interest groups.

The center sponsors a monthly invitational seminar series that draws faculty, students, and practitioners together to discuss current issues in risk analysis. Students also are encouraged to undertake applied research projects and dissertations on risk-related topics. Where appropriate, the center links students with prospective employers in the public and private sectors.

Injury Control Center

John D. Graham, Professor of Policy and Decision Sciences and Director of the Injury Control Center

Injury in America persists as the leading killer of children and young adults, and the estimated cost to society is $158 billion per year. The Harvard Injury Control Center promotes the prevention and treatment of trauma through scientific research, policy analysis, training, and communications. Prevention, emergency and acute care, and rehabilitation are all essential components of injury control. Research efforts encompass unintentional injuries as well as intentional violence such as suicide and child or spouse abuse.

The center, a collaborative enterprise based at the Harvard School of Public Health, works with experts at the Harvard Medical School, Boston University School of Public Health, the New England Medical Center, and the Education Development Center, Inc., to achieve its goals. The center also collaborates with the Massachusetts Department of Public Health and other government agencies.

Current research priorities include motor vehicle crash injuries, violence prevention, and trauma systems development. The center sponsors two injury control courses at the Harvard School of Public Health and organizes seminars on contemporary issues. The field of injury control offers challenging research opportunities and a myriad of timely dissertation topics for public health students. The center also provides information on careers within this dynamic field of public health.

Educational Resource Center for Occupational Safety and Health

Richard R. Monson, Professor of Epidemiology and Director of the Educational Resource Center for Occupational Safety and Health

The center's primary objective is to train occupational safety and health professionals to recognize and prevent occupational injuries and disease. Participants in the training program develop public health perspectives, a sensitivity about political climates, and the skills and knowledge needed to identify and prevent occupational impairments, disease, and injuries through control or elimination of harmful occupational exposures.

Since occupational health relies upon a number of disciplines to provide the elements of prevention and problem solution, the training is multidisciplinary in nature. Descriptions of the full-time academic programs and of the Occupational and Environmental Medicine Residency are included with the description of the Department of Environmental Health. Employment opportunities exist in universities, governmental agencies, industry, labor unions, consulting firms, hospitals, and clinics.

The center is partially supported by a grant from the National Institute for Occupational Safety and Health (NIOSH). Traineeship awards consisting of tuition, stipend, and health fee may be available on a competitive basis to qualified individuals undertaking approved training programs in occupational medicine, industrial hygiene, and occupational health nursing. Decisions about funding are made independently from the application process. All United States citizens and permanent residents are automatically considered for funding.

Other facets of the center include a substantial sponsored research program spanning a variety of occupational health problems and drawing upon the expertise of scientists in many disciplines. The center offers midcareer training through short-term courses, seminars, and workshops for physicians, nurses, industrial hygienists, safety engineers, and other occupational safety and health professionals, paraprofessionals, and technicians. The center also has an outreach program which networks with academic institutions, agencies, professional societies, public health departments, unions, companies, and community associations within the New England region.

For More Information write to Mr. Daryl Bichel, HSPH, 665 Huntington Avenue, Boston MA 02115, or call 617/432-3314.

Office of Continuing Education

David A. Shore, Director for Continuing Education and Educational Development

Since 1982, the Office of Continuing Education (OCE) has sponsored professional education courses for midcareer professionals to allow them to keep abreast of trends and new information in a wide program of public health fields.

OCE courses are designed to give professionals new information and techniques to take back to the workplace for immediate implementation. The practical curriculum includes courses in industrial hazards, ergonomics, planning for nuclear emergencies, legal aspects of occupational and environmental health, managing information systems, and managing health care organizations. During the 1993-94 academic year, the office will present more than 35 courses designed for professionals in medical management, nuclear safety and radiation protection, occupational health and safety, environmental management, and environmental and occupational law.

Courses are presented by faculty members of the School of Public Health, supplemented by recognized leaders working in a variety of public health fields. Selected courses use the case method of instruction; others include laboratory sessions and demonstrations with standard field equipment. Course participants are encouraged to share their own experience with other participants and with the faculty, to create a dynamic learning environment.

Continuing Education draws participants on an international scale, attracting physicians, health care executives, industrial hygienists, health physicists, radiation protection professionals, scientists, and engineers. Most participants are employed by public health and regulatory agencies, industrial installations, public utilities, health care organizations and consultant groups. Approximately 2000 professional personnel attended these programs in the 1992-93 academic year.

Career Outlook In today's rapidly changing public health environment, employers increasingly look to participants in these Harvard programs to take on new responsibilities, define new policy, and steer organizations through periods of change. All courses are approved for continuing education credit by industrial and medical licensing boards.

The following is a preliminary list of courses to be presented by the Office of Continuing Education during the 1993-1994 academic year. For more information and for a complete list of courses, call the Office of Continuing Education at 617/432-1171.

1993

Sept. 20-24	*Industrial Ergonomics: Human Factors in Occupational Safety and Health*
Sept. 28-Oct. 1	*Risk Analysis: Science, Assessment and Management*
October 18-22	*Fundamentals of Industrial Hygiene*
November 1-4	*Ambulatory Care: Leadership in a Changing Environment*
November 5-13	*Program for Health Systems Management*
November 8-11	*Commercializing Biomedical Technologies*
December 1-3	*Indoor Air Quality*
December 6-10	*Program for Executives in Managed Care*

1994

January 16-28	*Programs for Chiefs of Clinical Services*
February 6-11	*Advanced Program for Chiefs of Clinical Services*
March 14-19	*Advanced Training in Biomedical Research Management*
March (TBA)	*Occupational and Environmental Radiation Protection*
March (TBA)	*Fundamentals of Industrial Hygiene*
April (TBA)	*Managing Ambulatory Health Care*
May (TBA)	*Program for Executives in Managed Care*
June (TBA)	*Planning for Nuclear Emergencies*
June-August (TBA)	*Managing Health Programs in Developing Countries*

Admission • Registration • Financial Assistance

The Admissions Office

The Admissions Office of the Harvard School of Public Health is responsible for managing all aspects of the application process to the many departments and degree programs of the school. The staff members of the office advise students about the application process in general and, in particular, about the status of each applicant's application file, the application requirements for each degree program, and the submission of required items to supplement the application. The staff members guide more than 1,000 applications each year through a two-tiered review process to help departments and degree programs select a diverse and talented incoming class. Staff members also facilitate student enrollment by processing paperwork for student visas, maintaining admission statistics to help manage enrollment, and continuously reviewing and proposing policy changes to improve the admission process for the applicant. The Admissions Office is open Mondays, Tuesdays, Thursdays, and Fridays from 10:00 a.m. to 5:00 p.m. The office is closed Wednesdays.

Policy of Nondiscrimination in the Admission Process
The policy of Harvard University is to make decisions concerning applicants, students, faculty, and staff on the basis of the individual's qualifications to contribute to Harvard's educational objectives and institutional needs. The principle of not discriminating against individuals on the basis of race, color, sex, sexual orientation, religion, age, national or ethnic origin, political beliefs, veteran status, or disability unrelated to job or course of study requirements is consistent with the purposes of a university and with the law. Harvard expects that those with whom it deals will comply with all applicable anti-discrimination laws.

Increasing numbers of students with disabilities are enrolling at Harvard and are participating in a wide range of programs and activities. Every effort is made to meet the special needs of these students. There are, however, no separate academic programs for either the physically disabled or for students with learning disabilities; all enrolled students undertake the same program.

Note: The following information concerns applications to the Master of Public Health, Master of Occupational Health, Master of Science, Doctor of Science, and Doctor of Public Health programs. See page 38 for information about applying to the PhD program.

Obtaining an Application for Admission

Application forms for admission to all HSPH degree programs and information about special student status may be obtained from the Admissions Office, HSPH, 677 Huntington Avenue, Room G-4, Boston, MA 02115, or by calling 617/432-1030. Information about enrolling in individual courses as an alumnus/a of HSPH, an affiliate, a participant in the Tuition Assistance Plan, or as a Boston-area public health professional (see page 59 for information about nondegree status) may be obtained from the Registrar's Office, HSPH, 677 Huntington Avenue, Room G-4, Boston, MA 02115, or call 617/432-1032.

Obtaining Information About Admission

Applicants and potential applicants who have questions about admission requirements, degree programs, or any other aspect of applying to or enrolling in the school should contact any staff member in the Admissions Office or the Assistant Director of Admissions, at HSPH, 677 Huntington Avenue, Boston, MA 02115, or call 617/432-1031. The School of Public Health ordinarily does not conduct personal interviews for admission purposes. However, prospective students who will be in the Boston area and would like to visit the school may contact the Assistant Director of Admissions to inquire about scheduling an informal meeting. Depending on the time of year, and faculty availability at that time, she may be able to assist in arranging an appointment with a faculty member or a student whose interests parallel the applicant's.

The section *Degree Requirements* and the departmental descriptions in this *Register* discuss the requirements for admission to particular degree programs. In addition to meeting these requirements, applicants, through the submission of the application and supporting materials, must demonstrate to the School's Committee on Admissions and Degrees (CAD) their ability to undertake graduate-level study. The final decision on admission of an applicant rests with this committee.

Applying for Admission

Applicants may apply to only one degree program (MPH, MOH, SM, SD, or DPH) and must specify the concentration, if applicable, in which they plan to take the degree. If the applicant wishes to apply for a joint degree in two departments, both departments should be specified and requirements for admission to both departments must be satisfied.

Admission into degree candidacy is for full- or half-time study only. International students may be accepted into full-time study only.

Admission of a candidate is for a particular year (currently the 1994-1995 academic year); if enrollment for

that year is not possible, reapplication for another year is necessary and will be considered on the same competitive basis as a new application. Requests for deferments and other exceptions must be made in writing to and approved by the Committee on Admissions and Degrees. Deferments will not be granted if an applicant chooses to attend another school; in that case, reapplication for degree candidacy at HSPH is mandatory. The Harvard School of Public Health does not admit students for spring semester enrollment.

Applicants who wish to be considered for **financial assistance** should refer to the section in this catalogue on *Financial Assistance*. Questions may be directed to the Financial Assistance Office by writing 677 Huntington Avenue, Boston, MA 02115, or by calling 617/432-1867.

Application Deadlines

All complete applications received on or before January 15, 1994, will be considered in the priority admission cycle. Applicants are strongly encouraged to meet this deadline by submitting their application and *all* supporting documents (GRE scores, transcripts, letters of recommendation, application fee, and so forth) by this date. Be advised that departments and degree programs may fill to capacity with the first priority admission cycle and that financial assistance in the form of grants may be depleted as well.

All applications that remain incomplete as of January 15, 1994, but which become complete by March 15, 1994, and all other applications received after January 15, 1994, that become complete by March 15, 1994, will be considered in the late admission cycle. All applications that are received after March 15, 1994, and those that remain incomplete after March 15, 1994, will not be considered for admission for the 1994-1995 academic year.

Application, Supporting Documentation, and Application Fee Please refer to the instructions accompanying the application for more information regarding submission of materials required for application to degree candidacy. An application for admission is not considered complete and will not be processed until the following documentation is received in the Admissions Office:

- A completed and signed application form, an application file card, completed mailing labels, and a 500-word essay written by the applicant. This essay should describe the applicant's academic and professional history, area of interest at HSPH, reasons for wanting to enroll in the degree program, and professional public health career plans upon completion of the program.
- Official transcripts from all colleges, graduate schools, and/or professional schools attended, whether or not the applicant deems the academic credit earned to be relevant to a degree in public health. Degree(s) conferred at those institutions (if applicable), courses taken, and grades received should appear on the transcripts. A transcript is considered official only if it is received in an envelope sealed and signed by the registrar of the school issuing the transcript. Please refer to instructions and information contained in the application booklet for more detailed information.
- Letters of recommendation from at least three people who are well acquainted with the applicant's previous academic work and/or professional experience.
- Official scores of the Graduate Record Examination (GRE). (See *Standardized Tests*, following.) Applicants should take the GRE in October, but no later than the December test date, to be considered in the first admission cycle. (Refer to *Admission Deadlines*, above.) ETS will not report scores more than five years old, so applicants who took the GRE more than five years ago must retake the exam. (Note: For tests taken between October 1, 1972, and September 30, 1985, the Educational Testing Service (ETS) will report the scores for up to 20 years.)
- Official scores of the Test of English as a Foreign Language (TOEFL), if applicable. (See *International Students*, following.) No other English language skills test scores are acceptable. TOEFL will not report scores more than two years old; applicants who took the TOEFL more than two years ago must retake the exam.
- A non-refundable application fee of US $60 in the form of a check drawn on a bank in the United States, a postal money order, or an international money order payable to the Harvard School of Public Health.

Applicants are responsible for assuring that all materials are received in the Admissions Office by the application deadline. All materials submitted become the property of the Harvard School of Public Health, and will not be returned to the applicant.

Application Review Process Applicants are notified in writing of their application status soon after the application is received. If the application is complete as of the January 15 deadline, it progresses through a two-tiered review process, passing first through the departmental review process (or concentration review process, for MPH

applicants). A second review is conducted by the appropriate subcommittee of the Committee on Admissions and Degrees. This process normally takes from four to six weeks. Applications that become complete after January 15 are held until after decisions have been made on applications completed before that deadline.

If an application is incomplete, the applicant is notified in writing by the Admissions Office of the items needed. Only when the application is considered complete will it be sent through the review process. Therefore, it is in the applicant's best interest to make certain the application is complete when it is sent to the Admissions Office.

After a decision is made by the department (or MPH concentration, if applicable), and by the Committee on Admissions and Degrees, the applicant is notified in writing. The decision is considered final.

Tuition Deposit Applicants who are granted admission must submit a $200 tuition deposit when confirming acceptance of the offer of admission (usually no later than May 1). This deposit will appear as a credit on the fall student tuition term bill and is not refunded if the student fails to register.

Standardized Tests All applicants to the school are required to submit official scores from the Graduate Record Examination (GRE). The only other test scores that will be considered are listed below under the conditions indicated. There are no other exceptions to this rule and no other test scores will be considered. If submitting any of these test scores, note that the score must be reported directly from the testing service to be considered official. (Law students and lawyers: Please refer to application instructions for procedure for submitting LSAT scores.) If the testing service will not report the scores because of the length of time since the test was taken, the applicant must take and submit scores from the GRE.

The Dental Admission Test (DAT): The applicant submitting DAT scores must have a postgraduate dental degree, or currently must be enrolled in a postbaccalaureate dental degree program at an accredited dental school.

The Graduate Management Admission Test (GMAT): The applicant submitting GMAT scores must have been awarded an MBA or a DBA from an accredited school of management, or must currently be enrolled in a postbaccalaureate MBA or DBA degree program.

The Medical College Admission Test (MCAT): The applicant submitting MCAT scores must have an MD or currently must be enrolled in an MD degree program at an accredited medical school.

The Law School Admission Test (LSAT): The applicant submitting LSAT scores must have a postgraduate law degree, or currently must be enrolled in a postbaccalaureate law degree program at an accredited law school. Please note that the LSAT testing service will not send official LSAT scores to any school that is not a law school. Therefore, lawyers must request that the scores be sent to them and, in turn, must submit the scores to HSPH in the **UNOPENED** envelope in which they were received from ETS/LSAT.

These are the **only** standardized tests accepted by the Harvard School of Public Health. NO OTHER TEST SCORES ARE ACCEPTABLE.

Since applications will not be considered without test score reports, applicants planning to take the GRE should do so no later than the December test date. Results of the December examination are generally not available until 6-8 weeks after the examination. The applicant must request that ETS send official test reports to HSPH. Applicants to whom test scores have been sent directly may submit these unofficial score reports with their applications while waiting for ETS to forward official reports to HSPH. Applicants must request that ETS send official test reports to HSPH. Information about registration and test administration dates for the GRE may be obtained by writing to Educational Testing Service, Graduate Record Examinations, P.O. Box 6000, Princeton, NJ 08541-6000, or calling 609/771-7670.

Exceptions Waivers of the requirement to submit the GRE score **are rarely granted.** In unusual circumstances, however, when an applicant is unable to provide scores from a standardized test because of war or the unavailability of the test in a country where travel to another country to take the test is prohibitive, a written request to waive this requirement may be submitted with the application. The waiver request should describe in detail the circumstances that prevent submission of test scores. An applicant's professional experience or previously earned degree(s) is not sufficient grounds for waiving the test requirement. **If the waiver is denied, the applicant must be prepared to take the GRE by the December test date.**

Additional information concerning the standardized test requirement is included in the instructions accompanying the application.

International Students

Standardized Test for Demonstration of English Proficiency: The Test of English as a Foreign Language (TOEFL) All applicants from countries where English is not the language of instruction and applicants who have been US citizens or US permanent residents for less than one year and who are from countries where English was not the language of instruction, must take the TOEFL. The TOEFL score must be no more than two years old. A TOEFL score of 550 or above is required for admission to a degree program. The Committee on Admissions and Degrees prefers doctoral (SD or DPH) applicants to hold scores approaching 570, due to the demanding nature of the doctoral programs. No scores from any other tests taken to demonstrate English proficiency are accepted.

Foreign applicants, in rare circumstances, may be admitted with scores less than 550, but their admission is contingent upon their retaking the TOEFL and receiving a minimum score of 550. If an applicant is admitted with this contingency, and a score of 550 or greater is not reported to HSPH by September 1, 1994, the offer of admission will be revoked. Applicants from abroad may be admitted to special student status with a TOEFL score of at least 547 (see section on *Special Students* under *Nondegree Status*, below). However they may be required to complete an English course before attending courses at HSPH.

Applicants are advised to register to take the TOEFL no later than the November test date, since applications for admission will not be considered without the TOEFL score. The TOEFL is administered six times a year at centers throughout the world. Information regarding registration, testing locations, and test administration dates may be obtained by writing to TOEFL Services, P.O. Box 6151, Princeton, NJ 08541-6601, or calling 609/951-1100.

Academic Credentials Official transcripts of all college, university, and professional school academic records are required and must be issued directly from the institution, whether or not the applicant deems relevant academic credit was received from that institution. These transcripts must bear the institution's official seal, must be placed in a sealed envelope, and must be signed across the seal by the school's registrar. These transcripts must show the courses taken, the grades received, and the degree granted. **All documents not written in English must be translated into English.** Applications may be processed for admission with "unofficial" copies of academic credentials. However, an admitted applicant will not be allowed to register for classes until official academic credentials have been received by the Admissions Office. For more information about this requirement, please refer to the instructions accompanying the application form.

Financial Certification for Foreign Students If admitted to the school, applicants who are not US citizens or US permanent residents (green card holders), whether residing in the United States or not, must provide certification of their financial resources before the immigration form needed to obtain a visa (the I-20 or the IAP-66) will be issued. Admitted applicants must complete the financial certification form (supplied in the admission packet). International students must demonstrate that sufficient funds are available in United States currency to pay the expenses for the full period of their academic program and must show proof that they are permitted to exchange or export these funds.

In addition to providing this certification, international students wholly supported by personal funds, family funds, or sponsor's funds which are given directly to them are required to deposit these funds in a US bank. Funds adequate to cover, at a minimum, the first year's tuition, fees, and living expenses must be deposited in an escrow account in a bank in the Boston area. Before the immigration form can be issued, an official letter stating the amount held in the account in US dollars must be sent directly from the bank to the Admissions Office for each account.

An estimate of living expenses in the Boston area is included in the section *Living Expenses*. International students should use the applicable estimate when calculating funds required for financial certification. Students bringing their families to the US must transfer and certify adequate funds for their support as well.

Employment of Foreign Students International students who hold an MD degree and either an F-1 or J-1 visa under the sponsorship of Harvard University are not permitted to accept any employment for which an MD degree is a prerequisite while in this country. For more information, contact Maureen Martin at the Harvard University International Office, 1350 Massachusetts Avenue, Cambridge, MA 02138, or call 617/495-2789.

Health Insurance for Foreign Students All nonimmigrant students from abroad, without exception, are required to enroll in the Harvard Blue Cross/Blue Shield

student insurance plan. As of September, 1994, all J-1 visa holders *and* their families in the US (spouse and dependents) are required to enroll in the Blue Cross/Blue Shield health insurance plan. The cost of the Blue Cross/ Blue Shield Insurance for J-1 and F-1 visa holders's families is at additional cost. Please contact the Harvard University Student Insurance Office at 617/495-2008 for more information on family insurance coverage and the fees for that coverage.

Nondegree Status

Interested persons may be permitted by application to study at the school while in nondegree status. The categories of nondegree students are special students (application for admission necessary), Harvard faculty, Harvard staff of at least half-time, affiliates of Harvard hospitals, HSPH alumni/ae, and certain other Boston-area public health professionals. Students in nondegree status may not audit courses; courses must be taken for credit on an ordinal (letter grade) or pass/fail basis only. Harvard staff should consult the appropriate Office of Human Resources about the provisions of the Harvard Tuition Assistance Plan (TAP) for eligibility requirements and benefits.

US citizens and permanent residents may apply to the Admissions Office for full-, half-, or part-time special student status. Foreign applicants are considered for full-time status only. Other nondegree students should apply to the Registrar's Office and are limited to 10 credits per semester.

In each case, enrollment in courses is subject to the availability of space and the permission of the instructor and Registrar; if classes fill to capacity, preference is given to HSPH degree candidates. Payment in each case is on a per-credit basis, except for full- and half-time special students who are charged full- or half-time tuition rates. Payment is due prior to or at the time of registration, and is not refundable unless the student is removed from class due to over-enrollment. There are no exceptions to this rule. Permission to take courses in nondegree status carries with it no commitment by HSPH to accept the student as a degree candidate at a later date. All rules of the school pertain to these students.

Nondegree students enrolled less than full-time are not permitted to cross-register into other Harvard Schools or MIT.

Applications for affiliate, TAP, alumni, or Boston-area public health professional status can be obtained only by coming in person to the Registrar's Office no earlier than one week prior to the start of the course. The application procedure and deadlines for special student status are the same as for those applying for degree candidacy, and the application is available at the HSPH Admissions Office.

Special Students (Nondegree Status) Application procedures and requirements for the admission of half-time and full-time special students (nondegree) are the same as for degree candidates, and special student status is governed by the same policies that apply to all matriculated students. (Exception: At the discretion of the Committee on Admissions and Degrees, foreign students applying for degree candidacy may be admitted to special student status if their TOEFL score is between 547 and 550. These students may petition the Committee on Admissions and Degrees for reconsideration for degree candidacy upon receipt of a TOEFL score of 550 or better [see *Retroactive Credits* below].)

Applicants must specify on the application form the courses they plan to take as special students. Admission to special student status is limited to one academic year. Special students who wish to be admitted to degree candidacy, other than the exception described in the preceding paragraph, must reapply and will be considered on the same basis as other applicants for admission.

Retroactive Credits Applicants to degree programs who have taken courses at the school while in nondegree status may, at the time of their application, petition to count up to 10 credits retroactively as part of the academic credit requirements. These courses must have been taken within the preceding three years of the date of entrance into the degree program and may not have been counted toward any other degree at HSPH or at any other school. A request for retroactive degree credit must be approved by the department or program with which the student is affiliated and by the Committee on Admissions and Degrees. Permission may be granted if the courses fit into the applicant's academic degree program.

Applicants with Previous Harvard Degree Applicants who have cross-registered into the Harvard School of Public Health within the previous three years while enrolled at another Harvard school or at MIT may petition to count up to 10 credits of those courses toward their HSPH degree requirements only if the courses taken did not count toward another degree. The applicant must submit, at the time of his or her application, an official transcript from the other school, as well as a letter from that school's Registrar stating that the courses taken at the School of Public Health have not been counted toward another degree.

HSPH Alumni/ae Applicant Contacts

Below is a list of Harvard School of Public Health alumni/ae who have indicated their willingness to answer questions that potential applicants may have about the school. They can respond to queries about departments, curricula, possible career opportunities, and alumni/ae activities. These individuals also can refer applicants to other alumni/ae whose academic and/or career interests more closely match their own, or who live in their immediate area.

United States

Carolyne W. Arnold, SM'73, SD'77 (Health Services Administration)
Research Associate
Wellesley College Center for Research on Women
Wellesley, MA 02181

Mario Becker, MD, MPH'88, SM'89 (Maternal and Child Health)
400 Brookline Avenue, #214
Boston, MA 02215

Janis Curtis, SM'78 (Health Policy and Management)
4224 Mill Village Road
Raleigh, NC 27612

Jean Doherty-Greenberg, DMD, MPH'79 (General Program)
Great Lakes Geriatric Education Center
Chicago College of Osteopathic Medicine
5200 S. Ellis Avenue
Chicago, IL 60615

Johanna T. Dwyer, SM'65, SD'69 (Hygiene)
Lecturer, Harvard School of Public Health
Director, Frances Stern Nutrition Center
Tufts New England Medical Center
750 Washington Street
Boston, MA 02110

Vincent Guinee, MD, MPH'66 (Epidemiology)
3711 San Felipe, Apartment 11A
Houston, TX 77027

Charles T. Kaelber, MD, MPH'67, DPH'69 (Epidemiology)
Chief, Psychotherapy Research Program
Division of Clinical Research
National Institute of Mental Health
5600 Fishers Lane
Rockville, MD 20857

Ruth J. Katz, JD, MPH'80 (General Program)
Counsel
Subcommittee on Health and the Environment
US House of Representatives
2424 Rayburn House Office Building
Washington, DC 20515

Deborah Rose, SM'75 (Population Sciences)
NCHS
Center Building II, Room 2-44
3700 East West Highway
Hyattsville, MD 20782

Paul R. Torrens, MD, MPH'62 (Health Services Administration)
410 19th Street
Santa Monica, CA 90402

International

Herman Anker, MD, MPH'85 (General Program)
22 Gregers Gramsvei 0383
Oslo, Norway

Ninette Ravji Banday, BDS, MPH'82 (General Program)
109/1 Shahrah-e-Iran
Clifton, Karachi, Pakistan

Alessandro de Franciscis, MD, SM'85 (Epidemiology)
Vigna Brigida
Tuoro di Caserta 81029, Italy

David Farrar, MD, MPH'93 (especially for candidates from Australia)
P.O. Box 78
Potts Point N.S.W.
Sydney, Australia

Hector Izurieta, MPH'93 (especially for candidates from Spanish-speaking countries)
NCPS/DI/MS E05
US Centers for Disease Control
Atlanta, GA 30333
404/639-1864

Isidore S. Obot, PhD, MPH'85 (Behavioral Sciences)
University of Jos
Department of Psychology, PMB 2084
P.O. Box 10331
Jos, Nigeria

Franz Piribauer, MD, MPH'93 (especially for candidates from Eastern Europe)
Bernardgasse 39/30,
A-1070 Vienna
Austria
Telex: +47 75211706 pico a
Email: (Austria) A5751dab@vm.univie.ac.at

Jorge Serrano, MOH'93 (especially for candidates from Spanish-speaking countries)
13 Peabody Terrace #22
Cambridge, MA 02138

Sun-Dae Song, MD, SM'82 (Maternal and Child Health)
National Kong-Ju Hospital
King-Ju, Seoul, Korea 314-1

Jose Augusto C. Taddei, MD, MPH'80 (General Program)
Rua Conde de Bonfim 1271
Apartment 419
Rio de Janeiro, Brazil 20530

Boukje Van Noord-Zaadstra, MPH'81, SM'82 (Epidemiology)
Netherlands Institute of Preventive Medicine
NIPG Child Health Division
Waasenaarseweg 56, Postbus 124
Leiden, Netherlands 2300

Registration

All aspects of course registration and student record keeping are managed by the Registrar's Office. Members of the Registrar's Office staff assist students during registration and throughout the academic year, advising them about school-wide academic policies and procedures, requirements for the degree, what constitutes satisfactory academic progress, tuition charges, course scheduling, and the submission of petitions to subcommittees of the Committee on Admissions and Degrees. The Registrar's Office publishes the *Official Register*, the student and faculty handbooks, and the course schedule. This office sets the academic calendar and oversees cross-registration, waiving of school-wide biostatistics and epidemiology requirements, registration for nondegree students, and the procedures of dropping and adding courses and changing grading options of courses. This office also certifies degrees received, prepares academic transcripts, and certifies enrollment for loan deferment and international students' visa renewals. Staff members administer all aspects of registration for both fall and spring semesters and conduct academic and financial audits for three graduations per year. The Registrar's Office is a great source of information for students, faculty, administrators, and visitors, and its office hours are Mondays, Tuesdays, Thursdays and Fridays from 10:00 a.m. to 5:00 p.m. The office's service counter is closed on Wednesdays. The office can be reached by telephone Monday through Friday from 9:00 a.m to 5:00 p.m. at 617/432-1032.

Registration Procedures

Every resident degree candidate, whether full-time or half-time, is expected to register in person each semester until the requirements for the degree are fulfilled or until degree candidacy is terminated. The Registrar's Office cannot accept registration forms from any person other than the student who is registering.

Registration Dates Registration for fall semester 1993-1994 is September 13 for new students and September 14 for returning students. Registration for spring semester 1993-1994 is January 15 - 21, 1993. Please refer to the *Academic Calendar* in the front of this catalogue for all dates for the 1993-1994 academic year. Students cross-registering into other schools must meet the earlier deadline set by either HSPH or the school offering the course. A fee of $65 per week is charged for late registration and/or for late submission of the registration form. A student may request in writing late registration if he/she will be unable to register during these dates. For information on late registration, please contact the Registrar's Office at 617/432-1032.

Registration Clearance

Each student, new and returning, must be considered clear to register each semester before registration materials will be released. In order to be considered eligible to register, a student must have the following clearances.

Financial Clearance The Registrar's Office will not allow a student to register who is not financially clear. *To be considered financially clear, students must pay all past charges due to the university* and must take one of the following actions toward payment of the current semester's tuition and fees:

- Pay the current semester's charges in full.
- Enroll in the Monthly Payment Plan and pay the first month's installment prior to registering. This allows students to pay one-quarter of the semester's charges by registration and to spread the rest of the payments over the next three months (for the fall semester, October, November, and December). Students may request an application for the Monthly Payment Plan by writing the Student Billing Office, 566 Holyoke Center, Cambridge MA 02138. If the application is approved, the fee for this service is $25 per semester. Default on the Monthly Payment Plan will result in the student's administrative withdrawal from degree candidacy at HSPH. A student is considered in default if he/she misses a payment, or if any additional charges that appear on the term bill are not paid in full the month they appear.
- Obtain documentation from the School's Financial Aid Office that approved loans or grants processed by departments will cover the semester's full tuition and fees.
- Provide documentation in the form of an official award letter to the Registrar prior to registration that tuition and fees are being directly billed to and will be paid in full by a sponsoring organization.

Any student whose indebtedness to the university remains unpaid on the date fixed for payment will be denied all privileges of the university (administratively withdrawn from degree candidacy) and may not attend classes.

Immunization Clearance Massachusetts state law requires that all full-time students born after 1957 comply with immunization requirements. If, at the time of registration, the student has not complied with immunization requirements, he/she will be denied registration privileges until documentation is provided of the proper immunizations, or until the student is immunized. Immunization information is mailed to every accepted student in his/her

letter of admission. The University Health Services will provide immunizations prior to registration at a cost to the student. For more information on immunization requirements, please write the Harvard University Health Services, Longwood Campus, Vanderbilt Hall, Boston, MA 02115. Exceptions to this rule are made only for pregnant women, women of child-bearing age attempting pregnancy, or for people whose religious beliefs do not allow for immunization.

Academic Progress Clearance All continuing students must be considered to be making satisfactory progress at the time of registration. This includes:

- A minimum grade point average of 2.70 for continuing doctoral and master's degree candidates
- Maintenance of satisfactory progress for doctoral students. Doctoral students are considered to be making satisfactory progress toward the degree by having adhered to the doctoral student timetable and by submitting the appropriate forms to the Committee on Admissions and Degrees according to that timetable. Please refer to the *Student Handbook* for the timetable and sample forms. Doctoral students who have not maintained satisfactory progress will be allowed to register conditionally for two weeks until the appropriate form is submitted. If the appropriate form is not properly submitted within two weeks of registration, the student will be administratively withdrawn from degree candidacy for failure to maintain satisfactory progress.

International Office Clearance All new international students and all international students returning in a new degree program must report to the Harvard International Office (HIO), 1350 Massachusetts Avenue, Cambridge, **prior** to registering for their first semester at HSPH. There they must present their passports and entry permits or other evidence of their immigration status. After these documents have been presented at HIO, students will be issued a "blue slip" to present at registration before they are allowed to register. This requirement applies to all students who hold an F-1 student visa or a J-1 exchange visitor visa.

Admission Clearance All new students must have met all contingencies stated in their letter of admission prior to Registration.

If a student has met all the conditions stated above, they may proceed with the first step of registration, which involves picking up registration materials and information during the formal registration period. Each student will supply the Registrar's Office with biographical information, will be given registration forms and class schedules, and will be given the name of their academic advisor. According to the Buckley Amendment (Family Educational Rights and Privacy Act), each student will have the opportunity to restrict the distribution of directory information to persons not affiliated with Harvard University. If a student chooses to restrict their biographical information, *no details* pertaining to any aspect of the student's enrollment at HSPH will be given, under any circumstances, to anyone not conducting official Harvard University business.

Completing Registration

To complete the registration procedure, each student meets with his/her advisor to plan a course of study for the semester. The student then must file, in person, a registration form listing all courses to be taken that semester. On this form, students must indicate the grading option they elect (ordinal, pass/fail, or audit) for each course for which they are registering. Registration forms must be submitted in person and may not be submitted by persons other than the student without requesting, in writing, special permission from the Registrar. The registration form must contain the student's signature and the advisor's signature, as well as the course instructor's signature, if that is a requirement for taking the course.

Information on Registering for Courses There are three sections on the registration form:

- Section I: for HSPH courses numbered up to but not including 300-level courses
- Section II: for listing cross-registered courses
- Section III: for listing 300- to 349-level courses (tutorials) and courses numbered 350-level and above (for doctoral research credits only). If students are registering for tutorial credits, a completed tutorial contract must accompany the registration form.
- Students who wish to take courses jointly offered (cross-listed) by HSPH and another Harvard school must register for these courses on the HSPH registration form using the HSPH course catalogue code.
- Students who wish to cross-register for a course offered by another school must obtain a cross-registration petition from the Registrar's Office at HSPH, complete it, obtain the instructor's signature, and take it to the Registrar's Office of the school offering the course. Cross-registered courses also should be listed on the registration form in the appropriate section and the advisor's signature must appear next to each cross-reg-

istered course, signifying the advisor's approval of the course's relevance to the student's degree program. Students should note that undergraduate-level courses do not count toward total credits taken at HSPH, that those courses will not be included on the HSPH transcript, and that the grade points and credit hours received will not be counted toward the HSPH grade point average.

- Students who wish to take tutorial credits (300 to 349-level courses) should file a completed tutorial contract with their registration form on which the tutorial credit is listed. Students may earn up to five credits for each tutorial.
- Doctoral students who register for full-time research credit (350-level credits) must have passed their school-wide oral examination. If a doctoral student has not passed the oral examination, but he/she has completed all course work, he/she may register for full-time research credit for one semester only by obtaining the department chair's and the advisor's signatures on the registration form.

Students may not enroll in classes that meet at the same or at overlapping times.

Courses may be audited only by HSPH degree candidates; these courses will not appear on the student's official transcript.

Add/Drop/Change Policy

A student may add a course, drop a course, or change the grading option of a course without penalty within the first three weeks of each quarter. A student may petition the Committee on Admissions and Degrees to drop, add or change grading options after the published add/drop/change deadline only if a grade has not been given on any quiz or work assigned. Add/drop/change petitions will not be accepted after the published deadlines except in extreme circumstances. In these circumstances, the student should continue attending the class and must obtain his/her instructor's and advisor's signatures on the add/drop/change petition certifying that a grade has not been received by the student to date. This petition then is subject to the approval of the Committee on Admissions and Degrees. In addition, after the add/drop/change deadline, a $75 late fee will be assessed to the student's term bill for each petition approved. If a petition is not approved, the student will not be charged, nor will courses be added or dropped, or grading options changed. A student may petition to add, drop, or change up to three courses per form.

Students should note that some departments require that certain courses be taken on an ordinal (letter-grade) basis. Before choosing a grading option, students should confer with their departmental advisor about these regulations.

Add/drop/change forms cannot be accepted by the Registrar's Office if submitted by a person other than the student listed on the add/drop/change form.

Course Load Requirements

All degree candidates are expected to register as either full-time or half-time students. Any exceptions to this requirement must be approved by the Committee on Admissions and Degrees. Requests, if granted, generally are approved for only one semester at a time.

Full-Time Students

Students must take a minimum of 40 credits for the year to be registered as full-time. Students normally take 20 credits per semester. However, a full-time student may take a minimum of 15 credits in a semester, with a minimum of 5 credits in any one period, and may register for a maximum of 25 credits per semester. To take more than 25 credits in a semester, a student must submit a petition to the Committee on Admissions and Degrees at the time he or she submits the registration form. Full-time students who take more than 50 credits in a year are charged additional tuition on a per-credit basis.

Students in the two-year, 80-credit Master of Science program may take a minimum of 35 credits in either year, but if this is done, the student must take a total of 80 credits over the two-year program by taking 45 credits the following year. Any exceptions to this requirement must be approved by the Committee on Admissions and Degrees.

Students who are accepted into two consecutive one-year programs (40 credits each) and who are awarded one degree at the end of the first year must fulfill the requirements for a one-year (40-credit) program during the second year. Credits may not be carried over from the first program into the second. Persons in a 60-credit master's degree program must follow the guidelines for students in an 80-credit degree program, except that all 60 credits must be taken within three consecutive 20-credit semesters. Any exceptions to this requirement must be approved by the Committee on Admissions and Degrees.

Half-Time Students

Half-time students generally complete a one-year program in two academic years. A regular program for half-time students consists of 10 credits per semester, although they may register for a minimum of 7.5 and a maximum of 14 credits per semester for a total not to exceed 25 credits per year. Credits taken in excess of 25 per year are assessed an additional per-credit tuition charge; tuition paid for credits over 25 per year may not be applied toward total tuition requirements (See *Tuition Requirements*). Half-time students wishing to take more than 25 credits per year must petition the Committee on Admissions and Degrees for approval, in addition to paying extra tuition for the additional credits, and to having their status changed from half-to full-time status for insurance and immunization purposes.

Applying for the Degree

All degree candidates are expected to submit an application for degree (available in the Registrar's Office) prior to the deadlines published in this Register to be eligible for a degree in November, March, or June. Failure to apply for the degree by the deadline will prohibit the student from obtaining the degree in that month, and, if the month in question is June, from participating in Commencement activities.

Tuition and Fees for Academic Year 1993-1994

Degree Candidates

	ONE SEMESTER	*FULL YEAR*
Full-time resident tuition	$8,387.50 *†	$16,775.00 *†
Half-time resident tuition	4,200.00 *†	8,400.00 *†
Half-time, over 25 credits/year	460.00 /credit	

Doctoral Degree Candidates

(Full-time reduced tuition is paid after the equivalent of two years' full-time resident tuition has been paid)

Full-time reduced tuition	4,200.00 *†	8,400.00 *†
Half-time reduced tuition	2,112.50 *†	4,225.00 *†
Facilities fee (residents only)	1,062.50 *†	2,125.00 *†
Nonresident full-time fee	887.50 †	1,775.00 †
Nonresident half-time fee	512.50	1,025.00
Dissertation fee	895.00	N/A

Special Students, Affiliates, Boston-Area Medical Professionals

15 or more credits (full-time status)	8,387.50 **	16,775.00 **
7.5 to 14 credits (half-time status)	4,200.00 **	8,400.00 **
1.25 to 10 credits (affiliates, Boston-area medical professionals, alumni)		460.00/credit

Summer Session 1994

(Doctoral student research or master's student tutorial)

Five-credit unit summer program	2,135.00

Program in Clinical Effectiveness

Summer 1993 Program in Clinical Effectiveness	6,300.00
Continuation in full-time degree program: (For those beginning summer 1993 and expecting to complete degree 6/94)	
Fall 1993	2,100.00 *†
Spring 1994	8,400.00 *†
Continuation in half-time degree program: (For those beginning summer 1993 and expecting to complete degree 6/95)	
Fall 1993	2,100.00 *†
Spring 1994	-0-
Academic year 1994-1995 Billed at half-time rate for fall 1993 and spring 1994	
Continuation in half-time degree program: (For those who began summer 1992 and expect to complete degree 6/94)	
Fall 1993	4,200.00 *†
Spring 1994	4,200.00 *†

Fees

Leave of absence fee	200.00	400.00
Late registration fee	65.00/week	
Drop/add/change fee after deadline (Requires CAD approval)	75.00/petition	

Insurance

University Health Services Fee (Compulsory fee for all full-time degree candidates and special students registered for 15 or more credits)	307.00	614.00
Blue Cross/Blue Shield (Compulsory for nonimmigrant foreign students)	300.00 «	600.00 «

* Billed the University Health Services (UHS) fee separately. See the Registrar's Office for waiver form prior to registration if registered for half-time or fewer credits. *This fee is compulsory for students registered at more than half-time status.*

† Billed the Blue Cross/Blue Shield Insurance Coverage separately. See the Registrar's Office for waiver information prior to registration.

** Only Special Students admitted to full-time status and Clinical Effectiveness affiliates who will submit application for admission to full-time degree candidacy may register for full-time credit; Clinical Effectiveness affiliates who will submit application for admission to half-time status may register for half-time credit (7.5 - 14); all other affiliates, Boston-area medical professionals, and alumni are limited to 10 credits per semester and must pay fee *no later than at the time of registration.*

« Blue Cross/Blue Shield Insurance is required for all international students. Family health insurance is available for all students at an additional cost. For information and fees on family insurance, please contact the Student Insurance Office at 617/495-2008.

Information on Student Insurance Coverage

University Health Services (UHS) provides comprehensive prepaid medical care such as physical examinations, physician visits, laboratory tests, and psychological counseling. Students may establish a relationship with a particular UHS physician and may use the drop-in clinic for acute medical and surgical situations. Payment of the University Health Services fee is compulsory for all full-time students. Coverage extends from September 1 through August 31. Students who are half-time or less may waive the UHS coverage by completing a form available from the HSPH Registrar's Office prior to the first day of registration.

Blue Cross/Blue Shield The Blue Cross/Blue Shield (BC/BS) medical insurance plan, charged separately from the University Health Services fee, covers the cost of many types of medical care not offered at University Health Services. Students may enroll in the plan in September or January; coverage extends from September 1 through August 31. Students graduating in November or March should consult the Student Insurance Office for coverage termination information. Nonresident full-time students and resident full- and half-time students automatically are enrolled in the BC/BS plan. This insurance is compulsory for all nonimmigrant international students who do not have comparable insurance. It is also required for all other students who do not have comparable insurance.

United States students who have comparable US-based medical insurance and who would prefer not to enroll in BC/BS must submit a waiver form by registration in September (for the fall semester) or January 15 (for the spring semester). Students who fail to file waivers will be responsible for any fees billed for that semester. Waivers for BC/BS insurance are approved only by the Director of the University Health Services.

Family Insurance Family insurance coverage is available for spouses (including maternity benefits) and children of full-time students. The plan provides extensive benefits for ambulatory and inpatient care, and all who are eligible are strongly advised to enroll. Contact the Student Insurance Office for more information at 617/495-2008 for information about coverage and rates.

Enrollment in Insurance Plans and Information on Waiving Coverage Each resident student (full- and half-time) is automatically enrolled in and charged for both types of coverage on the student term bill. The charges on the bill appear in July for the fall semester and, if the coverage has not been waived, in December for the spring semester. Full-time nonresident doctoral students automatically are enrolled in Blue Cross/Blue Shield (BC/BS) insurance but *are not enrolled in* the UHS plan. Half-time nonresident doctoral students *are not enrolled in* either plan. Full-time resident and nonresident students who are US citizens and who have comparable US-based health insurance, and half-time resident students who are US citizens and who have comparable US-based health insurance who wish to waive the BC/BS coverage must return a completed BC/BS waiver form with documentation of their insurance to the Student Insurance Office in Cambridge prior to the first day of registration. Half-time students or part-time special students only may waive the UHS fee, if they wish, by completing a waiver form available in the Registrar's Office. However, if a half-time student takes over 25 credits per year, and has waived the UHS fee, the UHS fee will be charged retroactively for one semester. The UHS fee is compulsory for all full-time students and cannot be waived.

Information on Insurance Coverage for Non-registered Degree Candidates Degree candidates on leave of absence, those pending the receipt of a degree, and half-time nonresident students are not automatically enrolled in BC/BS or UHS. If coverage is needed, contact the Student Insurance Office in Cambridge at 495-2008 to inquire about coverage and rates.

Student Term Bills

Each degree candidate will receive a student term bill each month. Tuition, BC/BS, and UHS charges will appear in July for the fall semester, and tuition charges and insurance charges (if coverage was not waived) will appear on the December bill for the spring semester. Other charges also may appear on the term bill, such as course materials charges, library fines, charges not covered by the UHS (some dental and optical shop charges), and Harvard Real Estate (HRE) charges, for those renting from HRE.

Tuition charges are generated by the HSPH Registrar's Office. Students with questions about those charges should contact the Registrar's Office at 617/432-1032. Questions about other charges that appear on the bill should be directed to the office or department from which the charge was generated.

Payments toward the bill, or scholarship credits to the bill will appear as credit amounts with a minus (-) sign after the amount. It is very important to keep all bills and to review the bill each month.

Billing Address Term bills are sent to the address students give at registration as their billing address unless the Student Billing Office (located in Room 556 of Holyoke Center in Cambridge) is notified in writing to send them elsewhere. Students should keep the Registrar's Office and the Student Billing Office informed of any changes in local and/or billing addresses. The student term bill will be sent to the student's permanent address until a new billing address is provided at registration.

Sponsored Billing Some students are sponsored by a non-Harvard funding agency (the World Health Organization, the US military, or the student's government, for example). In this situation, the student should provide to the HSPH Registrar's Office and to the Harvard University Sponsored Billing Office original award letters from the sponsoring agency outlining the dollar amount awarded and the terms of payment *each year the student will be funded*. The student will receive monthly bills, and the Sponsored Billing Office will bill the financial sponsor once a semester, usually mid-semester, for the amount the sponsor agrees to pay. Questions regarding sponsored billing should be directed to Donna Ferguson, Harvard University Sponsored Billing Office, Holyoke Center, 5th Floor, Cambridge, MA 02138.

Nondegree Students Please refer to page 59 for more information on nondegree student status. Harvard faculty and staff, Harvard alumni/ae, affiliates, Boston-area public health professionals, and special students must pay all tuition and fees for the semester in full when they register. Payment is not refundable if the student elects to drop the course(s). Non-degree candidates may not audit HSPH courses. All deadlines and late fees apply to nondegree students, and all nondegree students are governed by the same rules and regulations outlined for degree candidates.

Tuition Requirements

After admission to HSPH and until fulfillment of the requirements for the degree, all degree candidates must be registered continuously in one of the following registration categories:

- Resident students
- Nonresident doctoral students
- Students on leave of absence

Degree candidates must pay full tuition for a designated number of years, depending on their degree program and their previous affiliation with the school. All degree candidates must pay the appropriate tuition rate for each registration period as outlined in the tuition and fees schedule; tuition may not be paid by degree candidates on a "per credit" basis, except for half-time degree candidates who take over 25 credits for the year. A degree candidate who registers for less than full-time must in any event fulfill the full-time, full-tuition requirements for the degree. Tuition for Harvard Summer School courses, Extension School courses, and additional tuition paid by half-time degree candidates for credits over 25 credits per year will not count toward the fulfillment of these tuition requirements. Tuition for up to 10 credits paid by affiliates within the preceding year of enrolling in a degree program may be counted toward a degree. Tuition paid by Tuition Assistance Plan (TAP) participants will not be credited toward any tuition requirements for the degree. Accumulation of tuition paid by nonresident doctoral students will not be credited toward the two-year full-time and one-year full-time reduced tuition payment requirement.

Resident Status All degree candidates who are enrolled in courses or who intend to use any Harvard academic facilities (such as computing facilities or libraries) must register as resident students.

Tuition requirements for resident doctoral students are listed below.

1. Students who previously have not attended HSPH pay a minimum of two years of full tuition and one year of full-time reduced doctoral tuition, or the equivalent for half-time degree candidates.

2. Students who have received a one-year master's degree from HSPH within three years of enrolling in a doctoral program in the same discipline pay a minimum of one year of full tuition and one year of full-time reduced doctoral tuition or the equivalent for half-time degree candidates.

3. Students who have received a two-year master's degree from HSPH within three years of enrolling in a doctoral program in the same discipline pay a minimum of one year of full-time, reduced doctoral tuition or the equivalent for half-time degree candidates.

4. Students who have received a Master of Public Health degree and a Master of Science degree from HSPH within three years of enrolling in a doctoral program in the same discipline as one of the HSPH master's degrees pay a minimum of one year of full-time reduced doctoral tuition or the equivalent for half-time degree candidates.

5. After the tuition requirement has been met, doctoral students pay a facilities fee, enabling students to use Harvard academic facilities.

Please refer to the table in the doctoral handbook for more detailed guidelines on tuition assessment.

Nonresident Doctoral Students Doctoral students who have passed their oral examination, who no longer reside in the Boston area, and who have received permission from their department and the Committee on Admissions and Degrees to pursue a portion of their program as a nonresident student, are charged the applicable nonresident doctoral fee. Students in this category normally have completed payment of at least the required two years of full-time tuition and one year of reduced doctoral tuition before applying for nonresident status; they must in any case complete this payment prior to their graduation and will be billed accordingly while in nonresident status to complete the tuition degree requirements. Full- and half-time nonresident status is granted for only one year at a time. Students must reapply yearly for renewal of this status. Students in nonresident status are expected to maintain satisfactory progress according to the doctoral student timetable (see *Student Handbook*). Students who fail to reapply for nonresident status on a yearly basis will be administratively withdrawn from degree candidacy.

The nonresident doctoral fee covers periodic consultation with the student's doctoral advisor but does not provide for the use of Harvard facilities or for the issuance of a Harvard identification card. Also, students registered for half-time nonresident status may not qualify for deferment of educational loans. Upon expiration (or early termination) of permission for nonresident status, or if the doctoral student requires the use of Harvard facilities during nonresident status, the appropriate resident rate will be charged.

Students on Leave of Absence Degree candidates who, during a given registration period, will not be engaged in any study or research for a degree from the school, and who will not be making use of Harvard facilities, must apply for a leave of absence. The application should be made prior to the registration period for the semester during which the leave of absence would begin. Students on leave of absence are required to pay the current year's leave of absence fee to maintain their degree candidacy. Upon expiration or earlier termination of the leave of absence, students are charged the appropriate tuition rate. Leaves of absence are granted for a maximum of one year at a time. Students must reapply yearly for renewal of this status. Students who fail to reapply on a yearly basis will be administratively withdrawn from degree candidacy. It is assumed that doctoral students on leave of absence are not participating in any research activities that may contribute to their dissertation.

If a student on leave of absence does not officially register for the semester he/she is expected to return to HSPH, the student automatically is withdrawn from degree candidacy. If, at a later date, with the consent of the Registrar and the student's department and advisor, the student wishes to be reinstated into degree candidacy, the student either must pay the current year's leave of absence fee for each semester the student was away from HSPH, or reapply for admission to the school.

Field Studies Opportunities for field studies are listed under each department's course offerings and bear the course number 330. These courses often entail travel expenses that must be paid by the student. Information about estimated expenses should be obtained from the appropriate department offering the study.

Expenses

Estimated Student Expense Budgets for 1993-94 Academic Year
(Calculated for nine months: September - June)

	Single	Married	Married/1 Child
Full-time resident tuition	$16,775	$16,775	$16,775
University Health Services fee	614	1,228	1,568
Student health insurance	600	1,782	2,680
Books/supplies	1,100	1,100	1,100
Rent/utilities	7,000	7,700	8,300
Food	2,100	3,100	3,600
Personal	3,000	4,500	5,400
Local transportation	511	985	1,077
Total	**$31,700**	**$37,170**	**$40,500**

- The University Health Services Fee is compulsory for all full-time students. The student Health Insurance is through Massachusetts Blue Cross/Blue Shield and is required for all international students. US students may waive this requirement if evidence of comparable coverage is approved by the University Health Insurance Office.
- Included with the cost of books/supplies is the cost of photocopied articles and other materials which may be required for some courses. There is also a charge for photocopies made by the student.
- Rents in the Boston area may be substantially higher than in other areas. In the past, apartments have been difficult and expensive to find for September. Some students have needed to use rental agents (who charge fees of up to one month's rent) and also have been required to pay at least first and last month's rent. However, as a result of the softening of the Boston area real estate market, it is possible that it will be somewhat easier and less expensive to secure housing.
- International students should plan on an additional 10% for possible changes in currency exchange rates.

Please note that the following **are not included** in the estimate of expenses but should be considered when planning finances:

- Moving/relocation expenses
- Purchase of warm clothing
- Purchase of furniture/household goods
- Cost of car maintenance/insurance
- Day care for children
- Medical/dental expenses not covered by insurance
- Transportation costs to and from home during vacations

Financial Assistance

Financial Assistance for International Students

Very little funding is available for international students. Most financial assistance available through the school comes from the United States government and is restricted to citizens and permanent residents of the United States. A maximum of two full-tuition grants may be available for incoming international students. An applicant must be nominated by his/her department chairman or program director for consideration by the Financial Aid Committee. Nominated international students are asked to provide verification of their need for financial assistance. Interested applicants should write to their department chairman or program director for consideration.

Because school funds are extremely limited for international students, other arrangements should be made to bring sufficient funds to cover tuition and living expenses. The United States Department of Immigration requires official certification of the source and amount of financial support for an international student's academic program before the immigration form needed to obtain a visa can be issued.

HSPH also requires that a student deposit and hold in a Boston-area bank enough funding to cover tuition, fees, and living expenses for one or two years, depending on the length of the program.

School and university funds will not be available to assist students with tuition, fees, or routine living expenses.

Financial Assistance for United States Citizens and Permanent Residents

Grants through Academic Departments Some departments have training grants that may provide funds up to full tuition plus stipend. Eligibility for these grants is generally based on career goals, merit, experience, and availability of funds. An interested applicant should contact his/her department for information.

Grants through the HSPH Financial Assistance Office Full-time degree candidates who do not receive grant support from a department may be eligible for school tuition grants administered through the Financial Assistance Office. A limited number of partial tuition grants are awarded on the basis of financial need, academic competitiveness, department goals, and availability of funds. Loans generally make up the major portion of a student's financial assistance package. Funding for subsequent years must be applied for each year. No assurance can be made that HSPH will be able to offer a grant at any time during a student's enrollment.

Restricted Scholarships There are a limited number of restricted scholarships available through the **Harvard University Office of General Scholarships**. Applicants meeting certain criteria may apply for these scholarships. The deadline to submit all materials is **February 15, 1994.**

Applicants who qualify for any of the listed scholarships should check the one(s) for which they would like to be

considered on page 4 of the *1994-95 Application for Financial Assistance* and submit the required documentation to prove eligibility for consideration, as follows:

- *Natives/residents of particular area* Copy of birth certificate, voter registration, high school transcripts, elementary school report cards, or certification of registration in local school.
- *Natives/residents of foreign country* Copy of birth certificate, visa or transcripts from schools attended.
- *Graduate of certain school* Copy of transcript.
- *Descendants* Documentation of ancestry.

SCHOLARSHIPS FOR US CITIZENS AND PERMANENT RESIDENTS

John Austin Amory Scholarship Fund
descendants of *John Austin Amory* of the Harvard Class of 1907

Bright Legacy
descendants of *Henry Bright Jr. and Anne Goldstone*

Baxendale Scholarship
descendants of *Alan Bedford Hudson.* bearing the name of *Baxendale or Hudson* from *Brockton, MA (Plymouth County)* from *Bourne, MA (Barnstable County)*

Harold A. Berry Scholarship/Charles H. Smith Bequest
from *Rhode Island* (preference given to those who attended public schools in *Providence)*

Daniel Buckley Bequest
graduates of *Cambridge Rindge and Latin High School, Cambridge, MA*, and graduates of other public schools within the city of Cambridge

Cabot Corporation Scholarship
Descendants of employees of *Godfrey L. Cabot, Inc. or of its subsidiary and associated companies*

Frank Lawton Cady Scholarship and Frank Milton Cady Scholarship
graduates of *Mansfield High School, Mansfield, MA*

George Chase Christian Memorial Scholarship
residents of *Minnesota*

Mark D. Cory Scholarship
graduates of *Gadsen High School, Gadsen AL*

Richard N. Cross Fund
from *Bridgewater, MA*

Charles Downer Scholarship
family name or surname of *Downer (by right of birth)* descendants of the members of the Harvard College Class of 1889

Fiske Scholarship
graduates of *Boston Latin High School*, Boston, MA

Thomas Hooker Flint Memorial Scholarship
graduates from *Belmont Hill School*, Belmont, MA

Charles William Eliot Scholarship
descendants of *Charles Eliot*

Calvin and Lucy Ellis Aid
descendants of *David Ellis and Beulah Newell and John and Hannah Ellis*

Albert J. Lynch Scholarship
any descendant of *Governor Thomas Dudley*

Gustav L. Harris Scholarship
residents of *St. Louis, MO*

Harvard Club of Delaware
residents of *Delaware*

Horace De Y. Lentz Scholarship
residents of *Carbon County, PA*

Frederick E. Parlin Fund
natives of *Malden, MA or Everett, MA*

William Pennoyer Bequest
descendants of *Robert Pennoyer*; natives of *New Haven, CT*

Princeton Fellowship
For graduates of *Princeton University*; *first-year* graduate students only

Leon W. Redpath Scholarship
residents of *Ohio* (preference given to residents of *Stark and Tuscarawas Counties)*

Franklin Reynolds Fund
natives of *Marblehead, MA*

James A. Rumrill Scholarship
first-year graduate students who graduated from a college or university in *Virginia, North Carolina, South Carolina, Florida, Georgia, Tennessee, or Kentucky*

Ernest Frederick Slater Scholarship
residents of *South Carolina* (highest preference given to descendants of *Edward Frederick Slater;* preference given to residents of *Orangeburg, SC*)

Alexander Wheelock Thayer Bequest
students bearing the name *Thayer*

Helen E. Vickery Scholarship Fund
natives of *Fitchburg, MA*

INTERNATIONAL SCHOLARSHIPS/FELLOWSHIPS

For further information, also contact Marilyn Zax at the Harvard University Office of General Scholarships at 617/ 496-5278.

Zlatko and Joyce Balokovic Scholarship Fund
for a student from *Croatia* or *Yugoslavia*; nominations submitted by the Croation Academy of Arts and Sciences in Zagreb

Frank Boas Scholarship
for a student from *Belgium* or *Luxembourg*; nominations submitted by the United States Educational Foundation in Belgium

Columbian Scholarship Fund - Fundacion para la Education Superior (FES)
Colombian students in graduate program; need-based; financial documentation must be submitted to Financial Assistance Office; required to return to Colombia after completion of degree program. *For information contact:* Fundacion FES, Carrera 5a. No. 6-05, Apartado Aereo 5744, Cali, Colombia, telephone: (57) (23) 845933

Ecuador Scholarship Fund - Fundacion Capacitar
Ecuadorian students in graduate program; need-based; financial documentation must be submitted to the HSPH Financial Assistance Office; required to return to Ecuador after completion of degree program. *For information contact:* Fundacion Capacitar, Av. Amazpnas 477, Edif. Banco de los Andes, Of. 820/PO Box 423-A, Quito, Ecuador, telephone: (593) (2) 561808

Madame Marguerite Carriere Fellowship
awarded in alternate years to a *French* graduate student to study at Harvard and for a *Harvard student* to study in France. In 1994-95 this award will be available for a Harvard student to study in France.

Victor Emmanual Chapman Memorial Scholarship
for a *French* student to study in any department in the University

Horace Cecil Fisher Scholarship
generally awarded to a student from *England*

Jean Gaillard Fellowship
for a *French* student to pursue graduate work at Harvard

Greek Scholarship Fund
student from *Greece*; required to return to Greece after completion of degree program. *For information contact:* Alexandros Samaras, Patriarchou Ioakim 26A, Athens 10675, Greece, telephone (30) (1) 7229838

Harvard Club of Australia - Robert Gordon Menzies Scholarship Fund
for *Australian* student in graduate program; awards based primarily on basis of the importance of student's proposed work to Australia's development. *For information contact:* Registrar of the Australian National University, Canberra, Australia

Andrew Theodore Lyman and Henry Sturgis Grew Memorial Scholarships
preference given to *Chinese* students

Funding for Korean Students
Korean-US scholarship fund to help *Koreans* studying at colleges and universities in the US (both graduate and undergraduate). *For information contact:* the Consul General of the Republic of Korea for detailed information and application: Consulate General of the Republic of Korea, One Financial Center, Boston, MA 02111, telephone: 617/348-3660

Chong Ha Lee Fellowship for Korean Graduates from University of Seoul
student must demonstrate financial need;
To apply: Submit a letter to the HSPH Financial Assistance Office explaining financial situation

Mexican Foundation Fund
for *Mexican graduate students*; need-based, financial documentation required. *For information contact:* Mary Schneider Enriquez, Executive Director, Foundacion Mexico en Harvard A.C., Monte Pelvoux #220, Lamas de Chaputepec, Mexico DF 11,000, Mexico

Aristides Evangelus Phoutrides Scholarship
for students of *Greek* birth or parentage

Arthur Sachs Scholarship
for students from *France*; nominations made by Sachs Scholarship Committee in Paris; inquiries from French students should be addressed to Aurthur Sachs Scholarship, c/o Madame Genevieve Seznec, 41 Rue Molitor, Paris 75016, France

Peter Brooks Saltonstall Memorial
for students from the *Hawaiian Islands* and islands and countries west of Hawaii, including *New Zealand, Fiji, Australia, Japan, South Korea, Hong Kong, Taiwan, The Philippines, Vietnam, Indonesia, Malaysia, and Thailand*

Harvard Club of Australia - Robert Gordon Menzies Scholarship Fund
for *Australian* student in graduate program. *For information contact:* Registrar of the Australian National University, Canberra, Australia

Spanish Scholarship Fund - Real Colegio Complutense Scholarship (RCC)
Spanish students in graduate program; need-based; financial documentation must be submitted to the HSPH Financial Assistance Office; required to return to Spain after completion of degree program. *For information contact:* Real Colegio Complutense Inc., Holyoke Center, Room 764, Cambridge, MA 02138 USA., telephone: 617/ 495- 3536

Arthur Daniel Stillman Endowed Beneficiary Aid Fund
for student in field work or academic area related to Southeast Asia Studies; preference given to students from *Southeast Asia*

Federal College Work-Study Program (FCWSP) The Federal College Work-Study Program assists eligible students with employment opportunities. The FCWSP grant covers 70% of the student's wages; the employer pays 30% (plus 10% for FICA and workmen's compensation). Eligibility is based on financial need, other assistance received, and availability of funds. Preference is given to full-time students. Applications are available in the Financial Assistance Office at the beginning of the fall semester.

Loans

Programs United States citizens and permanent residents may be considered for the loans listed on the following chart.

Credit Some programs require a credit review for loan approvals. Following are some general guidelines lenders use to determine good or bad credit:

- *Good credit*:
  continuous pattern of prompt payments; all accounts are current; no delinquencies, defaults, or legal attachments to property
- *Bad credit*:
  late payments (60-90 days past due); consistently slow payments; current or recent delinquencies; collection action, accounts closed for non-payment, accounts charged off; repossession, foreclosures, or government claims; bankruptcy, judgment, suit, lien, or garnishment; defaulted loan payments

If a student cannot obtain a loan because of a poor credit rating, HSPH has no funds available to replace the denied loan. Students are advised to review their credit records for errors and any potential problems *before* coming to school. Credit reports can be requested by writing to one of the following credit services:

TRW
350 Fairfield Ave.
Suite 301
Bridgeport, CT 06605
203 /325-9663

Credit Data of New England
PO Box 1941
Brockton, MA 02403
508 /580-4800

Aggregate Debt The School of Public Health has no established limits on aggregate loan debt, separate from loan program limits. Students are advised to consider several factors when accumulating loan debt:

- Anticipated salary upon graduation: education loan repayment should not exceed 15% of gross monthly salary
- Future financial goals
- Seriousness of loan defaults
- Effects of loan debt on future eligibility for credit

1993-94 Information on Loans

Loan	Federal Stafford Loan	Federal Supplemental Loan for Students (SLS)	Federal Perkins Loan	Health Education Assistance Loan (HEAL)	SHARE/GradSHARE Loan
Interest Rate	*New Borrowers:* Variable; based on 91 day U.S. T-Bill + 3.10% with a cap of 9%. *Previous Borrowers:* continue with rates as established with first Stafford/GSL	Variable. Based on 52-week T-Bill + 3.10%; capped at 11%	5%	T-Bill + 2.5% while in school T-Bill + 3% during repayment	Monthly variable (maximum = prime + 2%) One-year renewable (maximum = prime + 4%)
Subsidized Interest	*Subsidized Stafford:* Yes, by Federal Government while student is enrolled full-time and during grace periods (6 or 9 months after graduation) *Unsibsidized Stafford:* No	No	Yes, similar to Subsidized Federal Stafford	No	No
Fees	*Subsidized Stafford:* Origination Fee: 5% Guarantee Fee: 1% *Unsubsidized Stafford:* 6.5% combined origination fee and guarantee fee	Origination Fee: 5% Guarantee Fee: 1%	None	About 7%	About 5-6%
Annual Limit	$8,500	$ 10,000	$5,000	$12,500	$7,500 Grad Share $20,000 Share
Aggregate Maximum	$65,500	$ 73,000	$30,000	$50,000	$33,000
Federal Need Analysis Required	Yes	Yes	Yes	Yes	No
Credit Review By Lender	No	Yes	No	Yes	Yes
Limited Funding	No	No	Yes	Yes	No
Lender	Harvard University or outside lender	Harvard University or outside lender	Harvard University	Outside lenders	Nellie Mae
Number of Years of Repayment (from date repayment starts)	10	5-10	10	10-25	4-20

Applying for Financial Assistance (US Citizens and Permanent Residents)

Anyone who is interested in being considered for any financial assistance through HSPH should submit financial assistance application materials as he/she is applying to the school. The steps for applying are as follows:

1. Complete, sign, and mail the **HSPH Application for Financial Assistance for 1994-95** (located in this Official Register) to Financial Assistance Office, Harvard School of Public Health, 677 Huntington Avenue, Boston, MA 02115.
2. A packet with the **Free Application for Federal Student Assistance (FAFSA) for 1994-95** and the **Financial Aid Form (FAF) for 1994-95** will be mailed to your permanent address.
3. The completed FAFSA and FAF forms should be completed as soon as possible and mailed to the appropriate processing centers. (Note: There is a fee for the FAF only.) Processing time is approximately four to six weeks.
4. Mail a copy of your 1993 Federal Income Tax Return, with all schedules, to the HSPH Financial Assistance Office. Applicants not filing taxes should submit a Non-Filer Statement indicating why taxes will not be filed.

For Permanent Residents

5. Mail a copy of the front and back of your alien registration card to the HSPH Financial Assistance Office.

Deadline **February 4, 1994** is the deadline for the following to be submitted to the **HSPH Financial Assistance Office:**

1. HSPH Application for Financial Assistance
2. Completed and processed FAFSA
3. Completed and processed FAF
4. The copy of your 1993 Federal Income Tax Form should be submitted as soon as it is available, however the processing of your application for assistance may be delayed without it.

Polices

Review Procedures The Financial Assistance Office reviews applicants *after they are admitted to HSPH and after their financial assistance applications are complete.* The review process is done in batches in conjunction with electronic downloads from the Admissions Office of admitted students. All complete applications are individually reviewed and award notification letters sent within one week of review.

Grant Awards Wait List Grant funds are extremely **limited**; most applicants receive a package of loans only. Applicants on a **wait list** for grants should be aware that this is **not** a guarantee of grant support at any time while at the HSPH.

Meeting Full Financial Need HSPH does not have a policy of meeting a student's full financial need since funds are not available to do so. Students are advised to save as much as possible towards their education to help lower the level of educational debt.

Appeal Procedures Applicants wishing to appeal the assistance package must do so in writing to the Financial Assistance Office.

Contingencies Retention of awards and loans is contingent upon making satisfactory academic progress (the maintenance of at least the minimal acceptable grade point average and the required number of credits).

Education Loan Defaults Applicants should be aware that the Harvard School of Public Health views the issue of defaulted education loans as a very serious matter. According to federal regulations, students in default are ineligible to borrow through any federal education loan program or to participate in the Federal College Work-Study Program. Students are also ineligible to receive any institutional support from the Harvard School of Public Health.

Policy of Nondiscrimination The policy of nondiscrimination described under *Admissions* holds for Financial Assistance decisions as well.

Financial Assistance Application

Application Deadline The deadline for completed Financial Assistance Applications is **February 4, 1994.** Applicants should be aware that completed applications received after February will be reviewed for loans only.

Financial Assistance for US Citizens and Permanent Residents

Please refer to the *Financial Assistance* section of the Official Register for details. The enclosed HSPH application for financial assistance should be mailed directly to the Financial Assistance Office. Upon receipt of this application, the Financial Assistance Office will mail a 1994-95 Free Application for Federal Student Assistance (FAFSA) and CSS Financial Aid Form (FAF) to the applicant. Applicants are urged to begin the financial assistance application process as they are applying for admission to facilitate the financial assistance application process.

For Further Information contact the Financial Assistance Office, Harvard School of Public Health, 677 Huntington Avenue, Boston, MA 02115

Courses of Instruction

HSPH courses are numbered from 100-400. Courses numbered 100-199 are considered introductory courses. Courses numbered 200-299 address specific topics and have requirements which are determined by the department and the instructor. Courses numbered 300-349 are tutorials and are arranged between the student and the tutorial supervisor (instructor). Courses numbered 350-400 are research courses and are reserved primarily for doctoral students who have passed their oral qualifying examination.

Each course description is comprised of the course code, course title, class session description, the length and number of sessions each week, number of credits, name(s) of the instructor(s), description of course content, course activities, course notes, and course meeting time and location.

The Course Code

Course codes are the unique combination of department abbreviations and numerals used to identify a certain course. Listed below are the abbreviations for all of the HSPH departments.

BIO	Biostatistics
CB	Cancer Biology
DBS	Division of Biological Sciences
EH	Environmental Health
EPI	Epidemiology
HPM	Health Policy and Management
HSB	Health and Social Behavior
MCH	Maternal and Child Health
NUT	Nutrition
PIH	Population and International Health
TOX	Molecular and Cellular Toxicology
TPH	Tropical Public Health

Some courses are sponsored by two HSPH departments and are represented by faculty members from both departments. These courses are identified as hybrid courses. Course codes for hybrid courses are a combination of the first two letters of the primary department's abbreviation (e.g., "BI" from BIO) and the first letter of the other department's abbreviation (e.g., "H" from HPM) so that the final product is a three-letter course code (e.g., BIH). Sponsoring departments are also identified in parentheses following the course title.

Courses that begin with "ID" are interdepartmental courses. The department who sponsors the course is identified in the parentheses which follow the course code and title.

Credits

The number of credits reflects the amount of course time and student work load. Tutorial and research credits are arranged with the tutorial or research supervisor. (Restrictions on credits may apply; please check course description for further information.)

Course Meeting Times and Locations

Course meeting times and locations are listed at the end of each course description. Please note that not all courses offered by HSPH take place on the HSPH campus. Refer to the key below when noting class meeting times and locations.

Key to Abbreviations

M	Monday
T	Tuesday
W	Wednesday
R	Thursday
F	Friday
MW	Monday and Wednesday
TR	Tuesday and Thursday
WF	Wednesday and Friday
III	Building 3, Kresge Building, 677 Huntington Avenue
II	Building 2, 665 Huntington Avenue
I	Building 1, 665 Huntington Avenue
DIV	Harvard Divinity School
FAS	Harvard Faculty of Arts and Sciences
GSAS	Harvard Graduate School of Arts and Sciences
GSD	Harvard Graduate School of Design
GSE	Harvard Graduate School of Education
HBS	Harvard Business School
HDS	Harvard Dental School
HLS	Harvard Law School
HMS	Harvard Medical School
KSG	JFK School of Government
MIT	Massachusetts Institute of Technology

Interdepartmental Courses

ID 201cd. Biology, Epidemiology, Economics, and Policy (BEEP): Malaria (Department of Tropical Public Health)

Lectures, seminars. One 3-hour session each week. 2.5 credits. Dr. Spielman. This course is designed to bring a multidisciplinary approach to a major public health problem in international health. Within the context of the biology and epidemiology of malaria, students are exposed to strategies of vector control, diagnosis, chemotherapy, and vaccines from the point of view of social, political, and economic policy. Impacts of programs are evaluated from an international and local perspective utilizing techniques from both the social and biomedical sciences.
Course Note: Signature of the instructor required.
R 1:30 - 4:20; Room 402, II

ID 211d. Vaccines: Past, Present and Future (Department of Cancer Biology)

Lectures, seminars, case studies. Two 2-hour sessions each week. 2.5 credits. Dr. Essex, Dr. Walsh, Guest Lecturers. This course covers methodology for new vaccine development, manufacturing and quality control, techniques to ensure appropriate use of vaccines, liability issues, cost-effectiveness analysis, and decision analysis regarding vaccines for future research, development and distribution. The course also covers the epidemiology of vaccine-preventable illness and how vaccines have changed their traditional patterns, issues in planning clinical trials of new vaccines and strategies to enhance vaccine usage.
Course Activities: Oral group presentations, class discussion.
Course Note: Knowledge of epidemiology of infectious disease is helpful.
TR 10:30 - 12:20; Room 1110C, I

ID 223cd. Epidemiology: Field Methods of Developing Countries (Department of Population and International Health)

Lectures, seminars. Two 2-hour sessions each week. 5 credits. Dr. Maguire. Examines the reality of epidemiological field work in developing areas. Participants write a grant application for an

epidemiological study using the WHO-TDR format. Topics covered include problem analysis and project planning, study design, sampling methods, data sources, questionnaire design, data collection and the use of computers, nutritional status assessment, rapid evaluation techniques, and health expenditure assessment.
Course Note: Signature of the instructor required indicating suitable background in general epidemiology and biostatistics and infectious and parasitic diseases as taught in introductory courses.
T 3:30 - 5:20; Room G-2, III
F 8:30 - 10:20; Room G-2, III

ID 227cd. Mathematical Models in Biology (Department of Biostatistics)
Lectures. One 2-hour session each week. 2.5 credits. Dr. Levins, Dr. Zelen, Dr. Awerbuch. Examines mathematical models as a basis for analyzing biological phenomena. Applied topics include spread of epidemics with emphasis on vector-borne diseases, compartmental distribution of drugs and toxic substances, carcinogenesis, molecular binding, diffusion bioassays, membrane transport, cell and enzyme kinetics, physiologic scaling, DNA sequencing and protein structures. Methodological topics include curve-fitting, experimental design, and computer simulation. Computer exercises will include curve-fitting, computer simulation, and data analysis. Student presentations include independent construction of a model or a description of one presented in the literature.
Course Note: This is an intermediate-level course for students in laboratory science and biostatistics; BIO 211cd or signature of instructor required.
F 1:30 - 3:20; Room 203, III

ID 230b. Health of Community Populations (Department of Health and Social Behavior)
Lectures. Two 2-hour sessions each week. 2.5 credits. Dr. Gortmaker, Dr. Wise. Principally targeted for those with interests in biostatistics, epidemiology, health policy, and management. Focuses on the common diseases particularly affecting persons living in poverty or near poverty conditions in urban America. Discusses the impact of socioeconomic, cultural, and environmental factors upon ill health. Provides an overview of the types of data available from which to identify community health problems. Presents and evaluates case studies from local communities.
Course Note: BIO 200ab or BIO 201ab required.
MW 8:30 - 10:20; Room 203, III

ID 240c. Principles of Injury Control (Department of Health Policy and Management)
Lectures. Two 2-hour sessions each week. 2.5 credits. Dr. Hemenway, Dr. Leiberman, Dr. Graham. This course examines one of our most serious public health problems — intentional and unintentional injury. Provide a framework for examining control options. Discusses and analyzes methods for the evaluation of prevention programs and the determination of the optimal combination of countermeasures. Specific categories of injuries, such as motor vehicle crashes, fires and violence are examined in detail.
TR 10:30 - 12:20; Room 203, III

ID 250a. Ethical Basis of the Practice of Public Health
Section 01 - Dr. Brennan
Section 02 - Dr. Reich
Section 03 - Dr. Roberts
(Department of Health Policy and Management)
Lectures, case studies. Two 2-hour sessions each week. 2.5 credits. Provides students with a broad overview of some of the main philosophical and moral ideas that are used as a basis for resolving debates of public health policy. Helps students develop their own capacities to analyze, criticize, evaluate, and construct policy-oriented arguments.
Course Note: Acceptance into the MPH Program or the Department of Health Policy and Management required; students must register for appropriate section; signature of the instructor required.
Section 01 - MW 8:30 - 10:20; Room 502, III
Section 02 - MW 8:30 - 10:20; Room G-2, III
Section 03 - MW 8:30 - 10:20; Room G-1, III

ID 251s. Ethical Basis of the Practice of Public Health: Health Care Delivery (Department of Health Policy and Management)
Lectures, case studies. Four 2-hour sessions each week. 2.5 credits. Dr. Brennan. Provides students with a broad overview of some of the main philosophical and moral ideas that are used as a basis for resolving debates of public health policy. Concentration will be on issues in health care delivery, focusing on society-wide morbidity and mortality. The course should help students develop their own capacities to analyze, criticize, evaluate, and construct policy-oriented arguments.
TBA

ID 261cd. Practice of Health Care Management (Department of Health Policy and Management)
Seminars, field studies. One 2-hour session each week. Eight hours each week. 5 credits. Dr. Calkins, Dr. Caper. Addresses the professional training needs of MPH students who plan to pursue leadership positions in the private sector. Students define and propose solutions to an important problem confronting an institutional sponsor by applying managerial and analytic techniques developed in the Health Care Management concentration. Students meet individually with advisers from HSPH and their host organization throughout the field placement. Seminars use case studies and readings to explore the practice of health care management.
Course Note: Acceptance into the MPH concentration in Health Care Management desirable; signature of the instructor required.
MW 8:30 - 10:20; Room 204, III

ID 262b. Practice of International Health (Department of Population and International Health)
Lectures, case studies. Two 2-hour sessions each week. 2.5 credits. Dr. Aitken, Dr. Cash, Dr. Herrera. Addresses practical issues in planning and implementing programs aimed at particular health programs in developing countries. Students use data sets on selected priority health problems to learn how to make a clear community diagnosis, to select appropriate control strategies and to plan the implementation of treatment and preventive care programs at the community level.
Course Note: Acceptance into the MPH concentration in International Health or signature of the instructor required.
MW 8:30 - 10:20; Room 502, III

ID 263b. Practice of Occupational Health (Department of Environmental Health)
Lectures, case studies. Two 2-hour sessions each week. 5 credits. Dr. Smith, Dr. Goldman, Prof. Burgess, Prof. Sherwood. Focuses on the assessment of workplace hazards, the physiology and biomechanical aspects of work, and a practical problem-solving approach to health

problems in various work settings. Emphasizes the relationship between working conditions and health, with special reference to the recognition, measurement, and control of industrial hazards.
Course Activities: Oral and written projects, class discussions, walk-through field trips to local industries (field trips may take up to 4 hours).
Course Note: EH 262ab desirable or signature of the instructor; no auditors.

ID 264cd. Practice of Public Management and Community Health (Department of Maternal and Child Health)
Seminars; field studies. Two 2-hour sessions each week. Eight hours each week. 5 credits. Dr. Gardner, Dr. Plough. Addresses the professional training needs of MPH students who plan to pursue leadership positions in the public sector or in community health. Students, in small groups, undertake field work in public or community health agencies. They apply managerial and analytic techniques developed in the Public Management and Community Health concentration to the solution of problems confronting these agencies. Student groups meet with advisers from HSPH and their host agency throughout the field placement. Seminars explore the practice of public management and community health through case studies and readings.
Course Activities: Field work, written and oral project report.
Course Note: Acceptance into the MPH concentration in Public Management and Community Health; signature of the instructor required.
MW 8:30 - 10:20; Room 201, III

ID 265b, c. Practice of Quantitative Methods (Department of Environmental Health)
ID 265b. Module I. Dr. Ware, Dr. Monson
ID 265c. Module II. Dr. Ware, Dr. Monson
Lectures, seminars, case studies. Two 2-hour sessions each week. 2.5 credits. Dr. Ware, Dr. Monson. Explores practical and conceptual issues in the design, conduct, analysis and evaluation of human studies through the discussion of current research. Students design studies to address important health problems. Class discussion and group projects are emphasized.
Course Note: Acceptance into the MPH concentration in Quantitative Methods or signature of the instructor required; grade received after each period; must register in each appropriate semester.
MW 8:30 - 10:20; Room G-2, III

ID 330f. Field Trip (MPH Program)
Three-day period between "c" and "d" periods. 1 credit. Dr. Cash. Centers for Disease Control, Atlanta, Georgia. The Centers for Disease Control (CDC) is a unique institution with many public health functions relevant to the educational and research interests of domestic and foreign students. This field trip will give students an overview of the activities of the CDC, as well as an opportunity to meet individually with professional staff. Lectures and tutorials relate to the various disciplines at CDC, including occupational diseases, surveillance systems, epidemiology, control measures for both chronic and infectious diseases, and CDC's role in international health. Other topics are arranged depending on the interests of the group.
Course Activities: A brief paper on the material covered is required of each student.
Course Note: Course enrollment is limited to 25 students; pass/fail only; signature of the instructor required.
TBA

Biostatistics

BIO 112a. Computing Principles and Methods I
Lectures, laboratories. Two 1.5-hour sessions each week. One 1.5-hour lab each week. 2.5 credits. Dr. Pagano, Dr. Fenton. Introductory course is designed to provide basic computer literacy to students from all disciplines. Topics include computer architecture and terminology; organization, capabilities, and limitations of computers; programming principles; database management; telecommunications; and data analysis software.
Course Note: Lab or section time to be announced at first meeting.
MW 1:30 - 2:50; Room G-2, III

BIO 113b. Introduction to SAS
Lectures. Two 1.5-hour sessions each week. One 1.5-hour lab each week. 2.5 credits. Dr. Pagano, Dr. Fenton. Provides intensive instruction in the use of SAS for statistical analysis, database management, and computer programming. Basic issues in each of these areas are discussed in the context of teaching the specific skills required to use SAS effectively.
Course Note: BIO 112a required; signature of the instructor required; course enrollment is limited to 25 students; credit is given for only one section of BIO 113b or e; lab time to be announced at first meeting.
MW 1:30 - 2:50; Room 502, III

BIO 113e. Introduction to SAS
Lectures. Five 2-hour sessions. Four 3-hour lab sessions. 1.25 credits. Dr. Pagano, Dr. Hunt. Provides instruction in the use of SAS for statistical analysis, database management, graphics, and computer programming. Basic issues in each of these areas are discussed the context of teaching the specific skills required to use SAS on personal computers.
Course Note: BIO 112a required; course enrollment is limited to 25 students; credit is given for only one section of BIO 113b or e; lab time to be announced at first meeting; signature of the instructor required.
MWF 10:00 - 12:00; TBA
TR 10:00 - 12:00; TBA
WF 1:00 - 4:00; TBA
R 1:00 - 4:00; TBA

BIO 200ab. Introduction to Statistical Methods
Lectures, laboratories. Two 1.5-hour sessions each week. One 2-hour lab each week. 5 credits. Dr. Testa. Covers basic statistical techniques which are important for analyzing data arising from epidemiology, environmental health, biomedical and other public health-related research. Major topics include elements of probability, introduction to estimation and inference, distribution-free methods, contingency tables, regression analysis, analysis of variance, and elements of study design. Applications are stressed. Designed as an alternate to BIO 201ab, for students desiring more emphasis on theoretical developments or those having had an introductory statistics course at the level of BIO 201ab.
Course Note: Courses in algebra and calculus strongly recommended; credit is not given for both BIO 200ab and BIO 201ab; lab or section time to be announced at first meeting.
TR 9:00 - 10:20; Room 502, III
Lab:
T 3:30 - 5:00; Room 201, III and 213, III

BIO 201ab. Principles of Biostatistics
Lectures, laboratories. Two 1-hour sessions each week. One 2-hour lab each week. 5 credits. Dr. Pagano. Lectures and laboratory exercises acquaint the student with the basic concepts of biostatistics and their applications and interpretation. Of course, the computer is used throughout the course. Topics include descriptive statistics, graphics, diagnostic tests, probability distributions, inference, tests of significance, association, linear and logistic regression, and life tables.
Course Note: Credit is given for only one of these courses: BIO 200ab, BIO 201ab, or
BIH 203 b,c,d; this course cannot be counted as part of the credit requirement for a major or minor doctoral field course; course enrollment is limited to 161 students.
TR 9:30 - 10:20; Room G-1

BIH 203b, c, d. Statistical Methods for Health Policy and Management (Department of Biostatistics and the Department of Health Policy and Management)
BIH203b. Module I. Dr. Williams
BIH203c. Module II. Dr. Williams
BIH203d. Module III. Dr. Fairclough
Lectures, case studies, laboratories. Two 1.5-hour sessions each week and one 1.5-hour laboratory session each week. 2.5 credits each period. Dr. Williams, TBA. Introduces students to probability and statistics, emphasizing their application in a variety of health policy and management contexts. Goals include establishing an awareness of basic statistical reasoning and an understanding of common difficulties in application. The STATA package is used throughout. Module I(b period): Topics include: descriptive statistics, probability and probability distributions, sampling distributions, experimental design and sampling methods, confidence intervals, hypothesis testing and p-values. Module II(c period): Topics include: power, sample size determination, nonparametric methods, analysis of categorical data, and introduction to simple linear regression. Module III(d period): Topics include: correlation, simple linear regression, multiple regression, and introduction to time series and logistic regression.
Course Note: Sections are graded separately; may not be taken for credit by students who have previously taken BIO 200ab or BIO 201ab; if substituted for BIO 200ab or
BIO201ab, all three modules must be taken and must be indicated on the registration form in each appropriate semester; one college-level course in mathematics required; enrollment of students not in the Department of Health Policy and Management requires the signature of the instructor; lab or section time to be announced at first meeting in each appropriate period.
BIH203b
TR 9:00 - 10:20; Room 213, III
BIH 203c
TR 9:00 - 10:20; Room 201, III
BIH 203d
9:00 - 10:20; Room 201, III

BIO 204ab. Biostatistics for Medical Investigators
Lectures. One 2-hour session each week. 2.5 credits. Dr. Gelman. This course is aimed at fellows, residents, and clinical investigators. Topics include diagnostic test analysis (sensitivity, specificity, ROC curves, Bayes Theorem), treatment effects (summary statistics, single, paired, and two-sample tests, analysis of proportions, survival data), models (linear, logistic, proportional hazards), and clinical trials (randomization, stratification, eligibility, blinding, interpretation).
Course Note: Lab or section time to be announced at first meeting.
W 5:00 - 6:50; Room 203, III

BIO 206s. Statistical Principles in Medical Research
Lectures. Five 1.75-hour sessions each week for seven weeks. 5 credits. Dr. Orav. Designed primarily for participants in the Training Program in Clinical Effectiveness. Topics include concepts in probability and statistics, hypothesis testing, non-parametrics, discrete data analysis, regression and analysis of variance. Emphasis is on allowing participants to think about issues in designing and analyzing studies. Theoretical issues are not pursued in depth.
Course Note: For participants in the Summer Program in Clinical Effectiveness only; instruction and additional labs for the SAS package are provided; lab or section time to be announced at first meeting.
TBA

DBB 207cd. Statistical Methods in Biology (Department of Biostatistics and the Division of Biological Sciences) (Course described under Division of Biological Sciences)

BIO 210cd. The Analysis of Rates and Proportions
Lectures. Two 1.5 hour sessions each week. One 1.5-hour session each week. 5 credits. Dr. Wypij. Emphasizes concepts and methods for analysis of data which are categorical, rate-of-occurrence (e.g., incidence rate), and time-to event (survival duration). Stresses applications in epidemiology, clinical trials, and other public health research. Topics include measures of association, 2x2 tables, stratification, logistic regression, matched pairs, analysis of rates, and survival data analysis using proportional hazards models.
Course Note: BIO 200ab or BIO 201ab or signature of the instructor required; lab or section times to be announced at first meeting.
TR 8:30 - 10:20; Room G-1, III

BIO 211cd. Regression and Analysis of Variance in Experimental Research
Lectures, laboratories. Two 1.5-hour sessions each week; one 1-hour lab each week. 5 credits. Dr. Neuberg. Covers analysis of variance and regression, including details of data-analytic techniques and implications for study design. Also included are probability models and computing. Students learn to formulate a scientific question in terms of a statistical model, leading to objective and quantitative answers.
Course Note: BIO 200ab or BIO 201ab or signature of the instructor required; lab or section times will be announced at first meeting.
TR 1:30 - 3:20; Room G-1, III

BIO 212cd. Survey Research Methods in Community Health
Lectures. One 2-hour session each week. 2.5 credits. Dr. Laird, Dr. Mangione. Covers research design, sample selection, questionnaire construction, interviewing techniques, the reduction and interpretation of data, and related facets of population survey investigations, Focuses primarily on the application of survey methods to problems of health program planning and evaluation. Treatment of methodology is sufficiently broad to be suitable for students who are concerned with epidemiological, nutritional, or other types of survey research.
W 3:30 - 5:20; Room 213, III

BIO 213ab. Applied Regression for Clinical Research
Lectures. Two 1.5-hour sessions each week. One 1-hour laboratory session each week. 5 credits. Dr. Orav. This course will introduce students involved with clinical research to the practical application of multiple regression analysis. Linear regression, logistic regression and proportional hazards survival models will be covered, as well as general concepts in model selection, goodness-of-fit, and testing

procedures. Each lecture will be accompanied by a data analysis using SAS, and a classroom discussion of the results. The course will introduce but will not attempt to develop the underlying likelihood theory.
Course Note: Previous introductory level statistics course and SAS programming ability required; lab or section time to be announced at first meeting; signature of the instructor required.
TR 8:30 - 10:20; Room G-2, III

BIO 214c. Principles of Clinical Trials
Lectures. Two 2-hour sessions each week. 2.5 credits. Dr. Hughes. Designed for individuals interested in the scientific, policy, and management aspects of clinical trials. Topics include types of clinical research, study design, treatment allocation, randomization and stratification, quality control, sample size requirements, patient consent, and interpretation of results. Students design a clinical investigation in their own field of interest, write a protocol for it, and write essays critiqueing recently-published medical literature.
Course Note: An introductory statistics course required.
MW 1:30 - 3:20; Room 202, III

BIO 216cd. Applied Survival Analysis
Lectures. Two 1.5-hour sessions each week. 5 credits. Dr. Ryan. This is an applied course for those wishing to learn about modern developments in the practice of survival methods. Topics include parametric distributions (exponential, Weibull), role of the hazard function, estimation of survival distributions using life table and maximum likelihood methods, two-population problems, proportional hazard models and regression, tests of proportional hazard assumption, and software for implementing testing and estimation procedures. Emphasis is on practical experience in survival data analysis.
Course Note: BIO 210cd, BIO 220ab, or BIO 221cd required.
TR 10:30 - 12:20; Room 213, III

BIO 217ab. Statistical Computing
Lectures, labaratories. Two 1.5-hour sessions each week. One 1.5-hour lab each week. 5 credits. Dr. Spino. An intermediate-level course introducing students to some computer-intensive methods useful in biostatistical applications. Most of the course time is spent learning fundamental ideas and algorithms involved with numerical analysis, matrix operations, simulation, and optimization. Implementation of selected frequently-used techniques, such as non-linear regression, maximum likelihood estimation, or exact tests is discussed.
Course Note: A course in biostatistics or statistics required; knowledge of a programming language required; lab or section time to be announced at first meeting; signature of the instructor required indicating suitable background.
TR 1:30 - 3:20; Room 203, III

BIO 220ab. Introduction to Statistical Modeling and Data Analysis
Lectures. Two 1.5-hour sessions each week. 5 credits. Dr. Propert. An introductory but fast-paced course in statistical methods for data analysis. Topics included are statistical inference, the analysis of normally-distributed data (including linear regression models and ANOVA), distribution-free methods, discrete data methods(including logistic regression). Emphasizes the use of likelihood-based modelling and inference.
Course Note: Aimed at first year Biostatistics degree candidates and second-year students from other department, who are proficient in basic calculus and linear algebra; signature of the instructor required.
MW 1:30 - 3:20; Room 202, III

BIO 221cd. Discrete Multivariate Analysis
Lectures. Two 1.5-hour sessions each week. Laboratory (optional). One 1.5-hour lab each week. 5 credits. Dr. Lipsitz. Deals with the use of statistical models for analyzing count data. Emphasizes practical application rather than mathematical theory. Extensive use is made of computer packages for data analysis. Topics include the analysis of contingency tables, chi-square and exact tests, measures of association, logistic regression, log linear analysis using iterative proportional fitting and the binomial, multinomial, and Poisson distributions.
Course Note: BIO 210cd, BIO 220ab, or signature of the instructor required; lab or section time to be announced at first meeting.
MW 10:30 - 12:20; Room 213, III

BIO 230ab. Probability Theory and Applications
Lectures, laboratories. Two 1.5-hour sessions each week. One 1-hour labs each week. 5 credits. Dr. Zelen. A first course in probability fundamental to the biostatistics program. Topics include: axiomatic foundations, frequency and personal concepts of probability, combinatorics, discrete and continuous sample spaces, independence and conditional probability, random variables, expectation operator, moments, generating functions and characteristic functions, standard distributions, transformations, sampling distributions related to the normal distribution, convergence concepts, weak laws of large numbers, the central limit and elements of stochastic processes.
Course Note: Multivariable calculus (one or two semesters beyond elementary calculus) suggested; lab or section time to be announced at first meeting; signature of the instructor required.
MW 10:30 - 12:20; Room 204, III
Lab:
T 3:30 - 5:20; Room 202, III

BIO 231cd. Statistical Inference I
Lectures, laboratories. Two 1.5-hour sessions each week. One 1.5-hour lab each week. 5 credits. Dr. Gray. A fundamental course in statistical inference. Discusses general principles of data reduction: exponential families, sufficiency, ancillarity and completeness. Describes general methods of point and interval parameter estimation and the small and large sample properties of estimators: method of moments, maximum likelihood, unbiased estimation, Rao-Blackwell and Lehmann-Scheffe theorems, information inequality, asymptotic relative efficiency of estimators. Describes general methods of hypothesis testing and optimality properties of tests: Neyman-Pearson theory, likelihood ratio tests, score and Wald tests, uniformly and locally most powerful tests, asymptotic relative efficiency of tests.
Course Note: BIO 230ab or signature of the instructor required; lab or section time to be announced at first meeting.
MW 1:30 - 3:20; Room 203, III

BIO 235ab. Regression and Analysis of Variance
Lectures, laboratories. Two 1.5-hour sessions each week. One 2-hour lab each week. 5 credits. Dr. DeGruttola. Describes general procedures of estimation and hypothesis testing for linear models: least squares and maximum likelihood estimation, Cochran's theorem, Gauss-Markov theorem, estimable functions, multivariate normal distribution, and simultaneous inference. Discusses techniques of analysis of variance and experimental design: partitioning sum of squares, factorial experiments, nested designs, analysis of covariance, and repeated measures.
Course Note: BIO 231cd or signature of instructor required; familiarity with matrix algebra; BIO 211cd or equivalent recommended; lab or section time to be announced at first meeting.
MW 8:30 - 10:20; Room 206, III

BIO 236ab. Analysis of Failure Time Data

Lectures. Two 2-hour sessions each week. 5 credits. Dr. Wei. Discusses the theoretical basis of concepts and methodologies associated with survival data and censoring, nonparametric tests, and competing risk models. Much of the theory is developed using counting processes and martingale methods. Material is drawn from recent literature.
Course Note: BIO 221cd and BIO 231cd required.
TR 10:30 - 12:20; Room 204, III

BIO 245cd. Analysis of Multivariate and Longitudinal Data

To be given 1993-94; offered alternate years. Lectures. Two 2-hour sessions each week. 5 credits. Dr. Laird, Dr. Rotnitzky. Presents classical and modern approaches to the analysis of multivariate observations, repeated measures, and longitudinal data. Topics include the multivariate normal distribution, estimation of the mean and covariance matrix, Hotellings T^2, MANOVA, the multivariate linear model, random effects and growth curve models, statistical analysis of categorical outcomes, and estimation with missing data. Presents Generalized Estimating Equations (GEE) and generalized normal models as extension of the normal theory. Discusses computational issues for both traditional and new methodologies.
Course Note: BIO 231cd and BIO 235ab required.
TR 1:30 - 3:20; Room 206, III

[BIO 246cd.] Generalized Linear Models

Not to be given 1993-94; offered alternate years. Lectures, labaratories. Two 2-hour sessions each week. One 1-hour lab each week. 5 credits. Dr. Tsiatis. Studies generalized linear models, as well as models with generalized variance structure. Parametric models include exponential families such as normal, Binomial, Poisson, and Gamma. Iterative reweighed least squares and quasi-likelihood methods are used for estimation of parameters as well as generalized estimating equations and quadratic estimating equations. Methods are extended to problems where no distributional assumptions are made about the errors except for the structure of the first two moments. Recent methods in the field are also studied.
Course Note: BIO 230ab, BIO231cd, and BIO 235ab required; lab or section time to be announced at first meeting.

[BIO 247cd.] Design of Scientific Investigations

Not to be given 1993-94; offered alternate years. Lectures. Two 2-hour sessions each week. 5 credits. Dr. Zelen. Discusses those aspects of statistical theory and practice relevant to the design of scientific investigations in the health sciences. Topics include sample size considerations, basic principles of experimental design (randomization, replication, and balance); fixed, mixed, and random models, clinical trials, block designs, two-way elimination designs, factorial experiments, analysis of covariance; longitudinal and observational studies.
Course Note: BIO 235ab or signature of the instructor required.

BIO 251cd. Statistical Inference II

Lectures. Two 1.5-hour sessions each week. 5 credits. Dr. Tsiatis. Sequel to BIO 231cd. Considers two principal topics: asymptotic theory, and theories of optimality. The asymptotics module includes limit theorems, multivariate delta method, properties of maximum likelihood estimates, semi-parametric efficient estimation, asymptotic relative efficiency, and hypothesis tests. The theories of optimality module discusses invariance, minimaxity, and Bayesian inference.
Course Note: BIO 231cd required.
MW 8:30 - 10:20; Room 203, III

BIO 261-269. Topics in Biostatistics

Offered primarily for students majoring in biostatistics or epidemiology, although qualified students from other departments are welcome. Topics covered vary each year, based on recent developments in biostatistics and the research interests of instructor.

BIO 263cd. Exact Nonparametric Inference

To be given 1993-94; offered alternate years. Lectures. One 2-hour session each week. 2.5 credits. Dr. Mehta. We study nonparametric and semi-parametric statistical methods of inference for: unordered and ordered contingency tables; one, two and k-sample problems; logistic, polytomous and Poisson regression; sample size considerations for ordered categorical response. The major emphasis is on the development of efficient numerical algorithms for exact and Monte Carlo inference, thus eliminating the need to rely on asymptotic methods in small, sparse or imbalanced data sets. The basic techniques utilized by these algorithms include discrete recursion, network and graph theory, dynamic programming, polynomial or generating function multiplication, and sampling from conditional distributions. Computer support is provided by StatXact and LogXact.
Course Note: Background in Probability and Inference desirable.
F 10:30 - 12:20; Room 201, III

BIO 266b. Real Analysis and Measure Theory for Biostatistics

Lectures. Two 1.5-hour sessions each week. 2.5 credits. Dr. Tsiatis. The purpose of this course is to familiarize Biostatistics students with some of the formalities and mathematical language of Real Analysis as well as going over some of the more salient points of measure theory.
Course Note: Basic background in calculus and linear algebra required.
F 8:30 - 10:20; Room 212, III

BIO 267ab. Sequential Methods for Clinical Trials

Lectures. One 2-hour session each week. 2.5 credits. Dr. Kim. Introduction to sequential methods in statistical analysis and their applications in biomedical research to clinical trials and bioassay. Topics include sequential probability ratio test (SPRT), modifications of SPRT and closed boundaries, stochastic approximation and its application in quantal bioassay, and sequential allocation. Recent developments in sequential methods for clinical trials, such as group sequential methods, repeated confidence intervals, and estimation following sequential tests and their application to censored survival data and repeated measurements data, will be covered. Also, sequential methods suitable for Phase I and II clinical trials will be discussed. This course is aimed at advanced graduate students in Biostatistics.
Course Note: BIO 230 and BIO 231 or equivalent required; signature of the instructor required indicating suitable background.
F 1:30 - 3:20; Room 203, III

BIO 268cd. Seminar on Statistical Methods in Human Genetics

Lectures, seminars. One 2-hour session each week. 2.5 credits. Dr. Laird. An introduction to statistical procedures for investigation of the inheritance of human characteristics through studies of families and populations. Topics to be addressed include the estimation of genetic parameters and the testing of genetic hypotheses; models for monogenic, oligogenic, polygenic, and "mixed" inheritance will be considered. Other topics include segregation analysis and likelihood-based approaches to linkage analysis, methods for the evaluation of major genetic effects, age of onset, and ascertainment will be discussed.
Course Note: BIO 230 and BIO 231 required; pass/fail only.
W 3:30 - 5:20; Room 206, III

BIO 269cd. Statistical Methods in Psychiatry
Lectures. One 1.5-hour session each week. 2.5 credits. Dr. Waternaux. Topics will include assessment of inter-rater reliability, (intraclass correlation and kappa statistics), analysis of repeated measures experiments, methods for handling dropouts and missing data, measurement error models, ROC curves, and methods of segregation and linkage analyses.
Course Note: Two Biostatistics courses at 200 level (Analysis of variance or regression) other than introductory, knowledge of statistical software (e.g. SAS or S) required; course enrollment is limited to 8 students; signature of the instructor required.
F 1:30- 3:20; Room 202, III

BIO 270cd. Statistical Science Outreach
Seminars. One 2-hour session each week. 2.5 units. Dr. Zelen, Dr. Wei. This is a seminar aimed at broadening the background of students in probability and statistics. Students will be expected to present short presentations from expository articles and papers. Articles will be chosen on the basis of ideas rather than technical content. There will be some emphasis on historical developments.
Course Note: Enrollment in a biostatistics degree program; this class cannot be used to satisfy the intermediate requirement for doctoral students in the department of Biostatistics; course enrollment is limited to 10 students; signature of the instructor required.
T 3:30 - 5:20; Room 212, III

HPB 280b. Decision Analysis for Health and Medical Practices (Department of Health Policy and Management and the Department of Biostatistics) (Course described under Health Policy and Management)

HPB 281c. Clinical Decision Analysis (Department of Health Policy and Management and the Department of Biostatistics) (Course described under Health Policy and Management)

HPB 282d. Cost-Effective and Cost-Benefit Analysis for Health Program Evaluation (Department of Health Policy and Management and the Department of Biostatistics) (Course described under Health Policy and Management)

BIO 310-315 a,b,c,d,s. Tutorial Programs
Time and credit to be arranged. Members of the Department. An opportunity for tutorial work is offered for interested and qualified students or small groups of students. Arrangements must be made with individual faculty members and are limited by the amount of faculty time available. These programs are open to all students who wish to go beyond the content of the regular courses. Six broad categories of this tutorial instruction are identified by the course numbers below.
Course Note: Completed tutorial contract is required at the time of registration; maximum of 5 credits per tutorial topic; pass/fail only; course enrollment requires the signature of the instructor.
TBA

BIO 310. Statistical Methods
Guided study in specific areas of statistical methodology and applications.

BIO 311. Teaching
Work with members of the department in laboratory instruction and the development of teaching materials.

BIO 312. Consultation
Work with members of the department on current statistical consultation activities.

BIO 313. Computing
Guided study in scientific programming, numerical methods, and data management.

BIO 314. Study Design
Guidance in developing statistical design of a study in which the student has a particular interest.

BIO 315. Data Analysis
Guidance in the statistical analysis of a body of data in which the student is interested. Students may register for BIO 310-315 for a maximum of 5 credit units in the summer term.

BIO 350 a,b,c,d. Research
Time and credit to be arranged. Members of the Department. For doctoral candidates who have passed their school-wide Oral Qualifying Examination and who are undertaking advanced work along the lines of fundamental or applied research in the department.
Course Note: Pass/Fail only; maximum of 20 credits; course enrollment requires the signature of the instructor.
TBA

Cancer Biology

[CB 204ab.] Immunobiology (Cross-listed as HMS-DMS 204)
Not to be given 1993-94; offered alternate years. Lectures. One 1.5-hour session each week and 1 hour DMS Weekly Immunology Seminar Series. 5 credits. Dr. Glimcher, Guest Lecturers. Examines the anatomy and physiology of the immune system, fate of antigen, cell trafficking, cellular interactions, and regulation of the immune response, and B and T cell recognition mechanisms. Principles of immunoregulation are discussed in the context of current literature.
Course Activities: Class participation, paper.
Course Note: Course enrollment is limited to 25 students; basic course in microbiology and immunology; signature of the instructor required.

CB 207ab. Radiation Biology (Cross-listed as HMS-706.51)
To be given 1993-94; offered alternate years. Lectures. One 2-hour and one 1-hour session each week. 5 credits. Dr. Little. Examines the biological effects of ionizing radiation, particularly as radiation serves as a model for the genotoxic and carcinogenic effects of environmental chemicals. The first period covers cellular and molecular processes including cell killing, mutagenesis, malignant transformation and chromosomal changes. The second covers effects in humans including the acute radiation syndrome, teratogenic, developmental and genetic effects, and the characteristics of external and internal exposures. Discussion of the human epidemiologic data for radiation carcinogenesis and their use risk in analysis emphasized.
Course Note: College-level course in biology required.
MF 1:30 - 3:20; Room 201, III

[CB 212ab.] Introduction to Cancer Biology
Not to be given 1993-94; offered alternate years. Lectures. Two 2-hour sessions each week. 5 credits. Dr. Liber, Dr. Kelsey. Emphasizes current experimental approaches to studying cancer biology and the process of carcinogenesis. Topics include the biology of cell modification and differentiation, the phenotype of the cancer cell, the properties of human and animal cancers, the process of cell transformation, mutagenesis, carcinogen metabolism and the general features of cancer epidemiology, and what these say about the causes of

human cancer. Early in the course, several introductory lectures are given to cover basic concepts of genetics, cell biology, and molecular biology.
Course Note: College-level course in biology required; course enrollment is limited to 30 students; signature of the instructor required.

CB 222d. The AIDS Epidemic: Status, Dynamics, Prospects, Conflicts
Lectures. One 2-hour session each week. 1.25 credits. Dr. Kanki, Dr. Essex, Guest Lecturers. Deals with a broad range of topics relating to the public health implications of the AIDS epidemic, including the virology, therapy, vaccines and etiologic hypotheses concerning the origins of the virus. Topics for discussion and review include the dynamics of the epidemic, public policy issues relevant to measures to reduce the spread of infection, economic implications, and social support needs of affected persons.
Course Note: Minimum enrollment of 8 students required; knowledge of virology or clinical medicine helpful; course enrollment is limited to 30 students; signature of the instructor required.
M 10:30 - 12:20; Room 203, III

CB223d. Design and Development of an AIDS Vaccine.
Lectures. One 2-hour session each week and one 1-hour review and discussion session each week. 2.5 credits. Dr. Essex, Dr. Lee, Guest Lecturers. AIDS has presented a unique situation to challenge most aspects of public health development and implementation. The design, development, and evaluation of an AIDS vaccine provides an ideal situation to understand how new generations of vaccines will be designed and tested. The course will bring together information on disease pathogenesis, the use of modern biomedical technology to design a vaccine antigen, and the guidelines needed for vaccine safety and efficacy testing for a chronic infectious agent such as HIV.
Course Note: Knowledge of virology and immunology required; signature of the instructor required.
TBA

CB 224cd. The AIDS Virus (Cross-listed as HMS-VIR 202)
To be given 1993-94; offered alternate years. Lectures. Two 2-hour sessions each week. 5 credits. Dr. Haseltine, Guest Lecturers. Provides students with a basic understanding of the biology of the AIDS virus as well as molecular properties of this virus. Covers areas such as initiation of infection, reverse transcriptase, integration, transcription integration, principles of virus particle assembly, immunology, and drug and vaccine development.
Course Note: Signature of the instructor required.
MW 1:00 - 3:00; TBA

CB 302-308 a,b,c,d. Tutorial
Time and credit to be arranged. Members of the Department. An opportunity for tutorial work is offered for interested and qualified students or small groups of students. Arrangements must be made with individual faculty members and are limited by the amount of faculty time available. These programs are open to all students who wish to go beyond the content of the regular courses. The various subject areas are listed below by category.
Course Note: Completed tutorial contract is required at the time of registration; maximum of 5 credits per tutorial topic; pass/fail only; course enrollment requires the signature of the instructor.
TBA

CB 304. Public Health Laboratory
Seminars. Department Faculty Associates at the State Laboratory Institute. The State Laboratory Institute is engaged in a variety of programs related to public health. These include: the development, preparation, and testing of new and standard serums, vaccines, and blood fractions; research in various aspects of applied immunology; various aspects of diagnostic service in the fields of bacteriology, virology, and congenital metabolic disorders; and field studies on arboviruses. Individual arrangements for study can be made in any of these programs.

CB 305. Tumor Biology
Seminars. Members of the Department. Approaches and techniques for the study of cancer as an infectious disease. Procedures used to study tumor cell and tumor virus marker antigens and antibodies demonstrated. The significance of these markers for epidemiological, etiological, and diagnostic investigations of various tumor systems of known and unknown causes are discussed. The relationship between the immune response and the oncogenic process are examined.

CB 307. Radiobiology (Cross-listed as GSAS-CB 347)
Seminars. Dr. Little. Current topics in radiobiology at molecular, cellular, and organismal levels. Cytotoxic, mutagenic, and carcinogenic consequences of ionizing and non-ionizing radiations are examined, with emphasis on genetic, physiologic, and environmental factors that modify these biological effects.

CB 350 a,b,c,d,s. Research
Time and credit to be arranged. Members of the Department. For doctoral candidates who have passed their school-wide Oral Qualifying Examination and who are undertaking advanced work along the lines of fundamental or applied research in the department. Full-time special students may register for CB 350 to undertake original research in virology, bacteriology, immunology, or in one of the disciplines available at the State Laboratory Institute. A number of the current research activities of the department are listed under CB 302-308. Inquiries about specific research opportunities should be addressed to the chair of the department.
Course Note: Pass/Fail only; maximum of 20 credits; course enrollment requires the signature of the instructor.
TBA

Division of Biological Sciences

DBS 205ab, cd. Interdepartmental Seminar in the Biological Sciences
Seminars. One 2-hour session in alternate weeks. 2.5 credits each semester. Dr. Wessling-Resnick. HSPH faculty present seminars on their current research in the biological sciences and direct a student discussion of the logic and experimental design of this research. Topics include chemical and viral carcinogenesis, DNA damage and repair, immunology, molecular biology, radiobiology, respiratory biology, and virology.
Course Note: Required for first-year students in the Division of Biological Sciences.
"ab" period
W 5:30 - 7:20; Room 212, III
"cd" period
W 5:30 - 7:20; Room 206, III

DBB 207cd. Statistical Methods in Biology (Division of Biological Sciences and the Department of Biostatistics)
Lectures, laboratories. Two 2-hour sessions each week. 5 credits. Dr. Catalano. Designed to familiarize students with the statistical methods used in laboratory research for design of experiments and statistical analyses of hypotheses. Topics include basic theory of

probability and statistics, analysis of continuous and categorical data, ANOVA and multiple regression, and nonparametric methods. Examples will focus on statistical problems encountered in laboratory research.
Course Note: Lab or section time to be announced at first meeting.
MW 10:30 - 12:20; Room 204, III

DBE 208cd. Topics in Pathophysiology of Human Disease (Division of Biological Sciences and the Department of Environmental Health)
Lectures, seminars. One 2-hour lecture and one 1-hour discussion section each week. 2.5 credits. Dr. Kobzik. This course will examine some major human disease problems by examining selected organ systems, including their normal physiology, the pathophysiology of major diseases, and the public health aspects of these major processes. Areas to be surveyed include the respiratory and cardiovascular systems; selected examples of disease processes affecting other organ systems will also be covered. The goal is to provide graduate students in the biological sciences with a perspective on major human diseases that integrates basic science, pathophysiology, and public health viewpoints.
9/21/93 course meets T 10:30 - 1:20; Room 212, III
After 9/21/93, TBA

DBE 221b. Methods in Cell Biology (Division of Biological Sciences and the Department of Environmental Health)
Lectures. Two 2-hour sessions each week. 2.5 credits. Dr. Kobzik. Designed to provide an overview of experimental approaches in cell biology for entering graduate students in the biological sciences. The goal is to appreciate how our view of cell biology is shaped by the methods we have available to examine cells, their structure, and their function. The course will survey morphologic techniques, including light, electron and other forms of microscopy; immunologic techniques, including immunofluorescence and immunohistochemistry; and assays of cellular functions, such as techniques for studying chemotaxis or receptor and mediated endocytosis, etc.
TR 3:30 - 5:20; Room 212, III

DBS 225cd. Applied Molecular Biology
Not to be offered 1994-1995; offered alternate years. Lectures. One 2-hour session each week. 2.5 credits. Dr. Shoemaker. This course teaches the theoretical and practical aspects underlying molecular biology technologies. Course material will include a detailed conceptual description of the various technologies, how the different procedures can work together to solve research problems, possible short cuts to employ and pitfalls to avoid. The goal is to provide researchers with the basis from which to most effectively incorporate molecular biology technology into their research programs.
Course Note: Basic cell and/or molecular biology course work desirable; signature of instructor required indicating suitable background.
Required:
M 3:30 - 5:20; Room 212, III
Optional:
W 3:30 - 5:20; Room 212, III

DBS 300 ab,cd. Laboratory Rotations
Laboratories. 12-20 hours each week. 5 credits each semester. Director, Members of the Division of Biological Sciences. Time and credit to be arranged. Members of the Department. An opportunity for tutorial work is offered for interested and qualified students or small groups of students. Arrangements must be made with individual faculty members and are limited by the amount of faculty time available. These programs are open to all students who wish to go beyond the content of the regular courses. Offers hands-on experimental methods of research in the biological sciences. Consists of individual original laboratory work. Includes participation in seminars, journal clubs, and assigned readings.
Course Note: Completed tutorial contract is required at the time of registration; maximum of 5 credits per tutorial topic; pass/fail only; course enrollment requires the signature of the instructor.
TBA

DBS 301. Special Seminar
Topics and meeting time to be determined.

Environmental Health

EH 201b. Principles of Environmental Health
Lectures, case studies. Two 2-hour sessions each week. 2.5 credits. Dr. Green, Dr. Evans, Dr. Brain, Dr. Spengler. This introductory course focuses on the science base that underpins risk assessment and standard-setting in environmental health and meets the requirement for the MPH degree. Textbook readings will provide the topical background material for understanding the hazards, exposures, toxic mechanisms, health effects, regulatory framework, and methods of management of air, water, food, and soil contamination. Classes will develop the analytic frameworks used to identify and quantify the relative risks of environmental exposures in the workplace and the general communities. Practice in applying these principles will be gained through landmark case studies of air, water, land, and workplace pollution.
Course Activities: Individual case presentations and group discussions; evaluation of performance will be through contribution to a case study, quizzes, and final examination.
MW 10:30 - 12:20; Room G-1, III

EH 202d. Introduction to Environmental Health
Lectures, case studies. Two 2-hour sessions each week. 2.5 credits. Dr. Green, Dr. Evans, Dr. Brennan, Dr. Graham. This introductory course focuses on environmental health policy and management and meets the requirement for the MPH degree. It is intended for the public health generalist who will need to address and speak on environmental and occupational health issues but not directly manage these problems. Textbook readings will provide the topical background material for understanding the hazards, exposures, toxic mechanisms, health effects, regulatory framework, and methods of management of air, water, food, and soil contamination. Emphasis will be placed on the competing interests of health risk, environmental preservation, and economic considerations in the formulation of policy options and management practices. Practice in applying these principles will be gained through landmark case studies of air, water, land, and workplace pollution. Evaluation of performance will be through contribution to a case study, quizzes, and final examination.
Course Activities: Individual case presentations, group discussions.
Course Note: Course enrollment is limited to 161 students.
MW 10:30 - 12:20; Room G-1, III

TOE 204ab. Principles of Toxicology (Cross-listed as HMS-BCMP 713 and FAS-BCMP 218) (Department of Molecular and Cellular Toxicology and the Department of Environmental Health) (Course described under Molecular and Cellular Toxicology)

EH 205ab. Human Physiology
Lectures, tutorials, demonstrations, and laboratories. Two 2-hour sessions each week. 5 credits. Dr. Shea, Dr. Shore, Dr. Banzett. An intensive introduction to biological principles, the physiology of cells, organ systems, and the organism. The course includes some pathophysiology. It is intended for students, including those lacking a background in biology, who have not had college physiology before.
Course Activities: Problem sets, exams, periodic required laboratories.
Course Note: College courses in physics, chemistry, and biology required; signature of the instructor required indicating suitable background.
MW 3:30 - 5:20; Room G-2, III

DBE 208cd. Topics in Pathophysiology of Human Disease (Division of Biological Science and the Department of Environmental Health) (Course described under Division of Biological Sciences)

EPE 215cd. Environmental and Occupational Epidemiology (Department of Epidemiology and the Department of Environmental Health) (Course described under Epidemiology)

DBE 221b. Methods in Cell Biology (Division of Biological Sciences and the Department of Environmental Health) (Course described under Division of Biological Sciences)

EH 223ab. Advanced Respiratory Physiology
To be given in 1993-94; offered alternate years. Lectures, seminars, student presentations. Two 1.5-hour sessions each week. 5 credits. Dr. Butler, Members of the Department. Covers a broad range of topics in respiratory physiology including: lung structure, volume and flow mechanics, surfactant function, gas exchange, lung and chest wall interaction. Special topics may include pulmonary circulation, lung endocrine functions, airway physiology and pharmacology. Reviews classic concepts and presents some recent advances.
Course Note: College-level physiology and EH 205ab or equivalent or signature of instructor indicating suitable background.
MW 9:00 - 10:20; Room 204, III

EH 225cd. Advanced Topics in Respiratory Biology
Lectures, supervised independent study. Two 1.5-hour sessions each week. 5 credits. Dr. Fredberg, Dr. Shore, Dr. Paulauskis, Dr. Wang. This course provides opportunities for students interested in the respiratory system to focus on special topics in lung biology. This year emphasis will be upon the fundamental physical basis and quantitative description of chemical, electrical and mechanical signalling. Specific topics covered will include passive diffusion, facilitated diffusion, solvent and solvent transport, channels, action potentials, membrane transport, receptor-ligand binding, second messengers, mechanical signalling.
Course Activities: Students will explore one particular aspect and write a major research paper.
MW 3:30 - 4:50; Room 1301, I

EH 231cd. Occupational Health Policy and Administration
Lectures, seminars, case studies. One 2-hour session each week. 2.5 credits. Dr. Nobel, Dr. Hashimoto, Dr. Boden. Examines the legal, economic, and political foundations of occupational health activities in the United States. Discusses the roles of government, unions, corporations, and research organizations. Helps students acquire an understanding of management functions in corporations.
Course Activities: Enables students to develop the knowledge and skills in the above areas necessary to apply medical, industrial hygiene, and statistical skills to achieve a healthful workplace.
Course Note: Non-EH students must have signature of the instructor; minimum course enrollment of 5 students.
T 3:30 - 5:20; Room 202, III

EH 232cd. Introduction to Occupational Medicine
Lectures. One 2-hour session each week. 2.5 credits. Dr. Hu, Dr. Christiani. Reviews the diagnosis following exposure to specific workplace substances, including asbestos, lead, organic solvents, and other substances. Considers methods of diagnosis of early organ system effects of chemicals and techniques for assessing disability.
Course Activities: Written and oral group projects.
Course Note: Limited to physicians or others with adequate training; basic course in toxicology strongly recommended.
F 10:30 - 12:20; Room G-2, III

EHE 235ab. Scientific Basis of Occupational Health Regulations (Department of Environmental Health and the Department of Epidemiology)
Seminars, case studies. One 3-hour session each week. 5 credits. Dr. Eisen, Dr. Wegman. Provides students with the opportunity to review the scientific basis for the association of selected occupational exposures and disease. Special emphasis is placed on the evaluation of the epidemiologic literature, occupational cancer, respiratory disease, and other kinds of occupational morbidity. Attention is directed to the interface of science and regulatory policy and the role of risk analysis in setting health standards.
Course Activities: Discussions of the process leading to setting of standards.
Course Note: EPI 200a or EPI 201a, and BIO 200ab or BIO 201ab, and ID 263bc required; EPE 215cd is strongly recommended; signature of the instructor required; course enrollment is limited to 15 students.
F 9:30 - 12:20; Room 209, III

[EH 238cd.] Occupational Health Nursing Management
Not to be given 1993-94. Lectures, seminars. One 2-hour session each week. 2.5 credits. Dr. Monson, Ms. Travers. Students apply skills and knowledge and occupational health programs. Includes organizational development, communcation skills, and techniques for managing change.
Course Note: This is an advanced course in occupational nursing; required for all students in Occupational Health Nursing.

[EH 239ab.] Case Studies in Occupational Health Nursing
Not to be given 1993-94. Seminars, case studies. One 2-hour session each week. 2.5 credits. Dr. Monson, Ms. Legendre. Provides a foundation for the development of skills and strategies necessary for program planning and development in occupational health through the critique of case studies of workplace situations and circumstances. Students identify health hazards, review injury/illness data, evaluate existing occupational health programs, and make recommendations. Prepares students for field placement in occupational health nursing.
Course Activities: Evaluation of case studies in occupational health nursing.

EH 241cd. Occupational Safety
Lectures, seminars. One 2-hour session each week. 2.5 credits. Dr. Mangone, Dr. Snook. Covers the principles of occupational safety. Topics include: growth of the field of occupational safety; safety regulation and standards; theoretical models of accident causation; accident investigation procedures; and engineering, behavioral, and administrative techniques for accident control. Builds toward the

development and validation of prescriptive systems for the alleviation of workplace hazards.
Course Activities: Lectures and group discussions relating to occupational safety.
F 8:30 - 10:20; Room 204, III

EH 243ab. Ergonomics/Human Factors
Lectures, seminars. One 2-hour session each week. 2.5 credits. Dr. Snook, Dr. Ciriello. Emphasizes the design of the job to fit the worker. Specific problems are investigated which result from the nature of the job itself, e.g., low back disorders, fatigue, cumulative trauma disorders, slips and falls, and human error. The physiological, biomedical, psychological, and anatomical characteristics of the worker are considered in the development of good job design principles.
Course Activities: Lectures and group discussions relating to ergonomics.
W 1:30 - 3:20; Room 213, III

EH 250cd. Control of Workers' Exposure at Hazardous Waste Sites
To be given 1993-94; offered alternate years. Lectures, laboratories. Two 2-hour sessions each week. 5 credits. Dr. Rudnick, Prof. Sherwood. Covers the evaluation, assessment, and control of workers' exposure to chemical, biological, and physical agents at hazardous waste treatment, storage, disposal, and clean-up sites and during emergency response activities. Topics include the use of personal and area field devices to measure workers' exposures, exposure control by work-practice modification, engineering methods, and personal protective equipment. This course is intended primarily for industrial hygiene students who will likely have responsibility for workers' health and safety at hazardous waste sites.
Course Activities: Written and oral reports, class discussion, laboratories.
Course Note: Participation in a hazardous substance, worker/supervisor, 40-hour basic course, which is necessary for anyone visiting a hazardous waste site, is required; HSPH degree candidates only; ordinal only; no auditors; lab or section time to be announced; signature of the instructor required.
TR 1:30 - 3:20; Room 209, III

[EH 252cd.] Organization of an Industrial Hygiene Program at a Hazardous Waste Sites
Lectures, field studies, laboratories. Not to be given 1993-94; offered alternate years. One 2-hour session each week (field trips may extend to 4 hours). 2.5 credits. Dr. Rudnick. Covers the organization of an industrial hygiene program for the purpose of limiting workers' exposure to chemical, biological, and physical agents at hazardous waste treatment, storage, disposal, and clean-up sites and during emergency response activities. Topics include the management of hazardous substances, medical surveillance, preparation of health hazard evaluation reports, OSHA standards. This course is intended primarily for industrial hygiene students who will likely have responsibility for workers' health and safety at hazardous waste sites.
Course Activities: Written and oral reports, class discussions, laboratories.
Course Note: EH 250cd required; no auditors; ordinal only; lab or section time to be announced at first meeting; HSPH degree candidates only; signature of the instructor required.

EH 253cd. Ventilation Control in the Workplace
Lectures, case studies. One 2-hour lecture or laboratory session each week (field trips may extend to 4 hours). 2.5 credits. Dr. Rudnick, Mr. DiBerardinis. This course covers the fundamentals and application of industrial ventilation as a means of controlling workers' exposure to particulate and gaseous air contaminants.
Course Activities: Written reports based on laboratory sessions and field trips, homework assignments, a ventilation design problem, and class discussion.
Course Note: No auditors; ordinal only; lab or section time to be announced at first meeting.
TR 10:30 - 12:20; Room G-2, III

EH 254cd. Control of Physical Stresses in the Workplace
Lectures, case studies, laboratories. One 2-hour lecture or laboratory session each week (field trips may extend to 4 hours). 2.5 credits. Dr. Rudnick, Prof. Sherwood. This course covers the fundamentals, evaluation, and control of noise, vibration and heat stress; and the application of respiratory protective equipment.
Course Activities: Written reports based on laboratory sessions and field trips, homework assignments, and class discussions.
Course Note: No auditors; ordinal only; course enrollment is limited to 11 students; lab or section time to be announced at first meeting; course enrollment is limited to 11 students.
TR 10:30 - 12:20; Room 209, III

EH 255c. Environmental Microbiology I
Lectures. Two 2-hour sessions each week. 2.5 credits. Dr. Ford. This course emphasizes environmental microbiology of aquatic systems addressing areas of current concerns including: bioremediation, release of genetically engineered organisms, pathogen survival in drinking water, microbiological control, biodeterioration, microbial indicators of pollution, and microbial transformations.
Course Activities: Video with discussion periods and term papers on a research area to be developed with the instructor.
TR 3:30 - 5:20; Room 201, III

EH 256d. Environmental Microbiology II - Aerobiology
Lectures, seminars. Two 2-hour sessions each week. 2.5 credits. Dr. Burge, Dr. Milton, Mr. Muilenberg. This course emphasizes the microbiology of the air including a review of the nature of organisms producing aerosols; the nature of aerosols and the dynamic of aerosols populations; exposure assessment issues, and an overview of bioaerosol-related health effects including the nature of the diseases, epidemiology, and risk assessment.
Course Activities: Lectures, discussions, research papers.
TR 3:30 - 5:20; Room 201, III

EH 259cd. Indoor Environments: Designing Healthful Buildings (Cross-listed as GSD-6300)
Lectures, case studies. Two 2-hour sessions each week. 5 credits. Dr. Spengler, Dr. Burge, Dr. Diamond, Dr. P.B. Ryan. The quality of indoor environments depend on many factors including ventilation, lighting, air contaminants, energy, furnishings, noise, ergonomics, among others. The health and comfort aspects of indoor environments are presented. Using a design/modeling approach the elements of healthful buildings (housing, offices, schools, etc.) will be demonstrated.
Course Activities: Lectures, readings, written and oral group projects.
Course Note: Signature of the instructor required.
HDS, TBA

EHH 260cd. Fundamentals of Exposure and Risk Assessment (Department of Environmental Health and the Department of Health Policy and Management)
Lectures. Two 2-hour sessions each week. 5 credits. Dr. Evans, Dr. Graham. Covers principles of exposure and risk assessment; introduces basic methods for monitoring and modeling the concentration of pollutants in the environment; distinguishes concentration, exposure and dose; describes hazard identification, dose-response evaluation, and risk characterization as elements in risk assessment; considers methods for error analysis and computation of the value of improved information.
Course Activities: Lectures, discussions, computer workshops, case studies.
Course Note: Calculus and chemistry courses required; course required for concentrators in environmental management; signature of the instructor required indicating suitable background.
TR 10:30 - 12:20; Room 204, III

EH 261ab. Properties of Environmental Contaminants
Lectures. Two 2-hour sessions each week. 5 credits. Dr. Koutrakis, Members of the Department. Covers the properties of environmental contaminants and the physical principles underlying their behavior. Topics include kinetic theory of gases, aerosols, thermodynamics, and combustion. Introduces air and water pollution, transport phenomena, and equilibria between environmental interfaces.
Course Activities: Class discussion, oral and written projects.
Course Note: College calculus, physics, and chemistry required.
TR 1:30 - 3:20; Room 213, III

EH 262ab. Introduction to Occupational Hygiene
Lectures, case studies. One 2-hour session each week. 2.5 credits. Dr. Smith, Prof. Sherwood, Guest Lecturers. The course comprises introductory lectures and discussions on key aspects of industrial hygiene, covering recognition, evaluation and control of health hazards at work. Consideration is given to chemical, physical and biological hazards, and the criteria for each. One or more visits are made to workplaces.
Course Activities: Written projects, class discussion, field trip(s).
Course Note: While intended primarily for students planning a career in that field, it provides background to the subject for students studying environmental issues and is strongly recommended for students intending to take ID 263cd.
M 1:30 - 3:20; Room 204, III

EH 263cd. Analytical Chemistry and Exposure Assessment
Lectures. Two 2-hour sessions each week. One 4-hour laboratory session each week. 5 credits. Dr. Yanagisawa, Dr. Smith, Dr. Shapiro. To assess human exposures to environmental pollutants in occupational or community settings, a group of students conducts two field investigations. Various techniques in analytical chemistry and radiation measurements appropriate for the exposure assessment are explained at the beginning of the course. Groups of students are required to design and implement the field investigations using these techniques. The design and results of the projects are presented in a class. This course is intended primarily for students considering environmental science or industrial hygiene professions. It is a mid-level course with an integration of analytical chemistry, statistics and field operation.
Course Activities: Field and lab work, two written individual project reports, group class presentation, and class discussion.
Course Note: EH 273ab Industrial Hygiene Internship or EH 274b required; lab or section time at first meeting; course enrollment is limited to 16 students; signature of instructor required.
TR 8:30 - 10:20; Room 212, III

[EH 264d.] Environmental Health Evaluation and Management
Lectures, seminars, case studies. Two 2-hour sessions each week. 2.5 credits. Dr. Harrington. Introduces quantitative approaches for modeling, evaluation, and management, with an emphasis on applications in environmental engineering, natural resource development, and risk management literature are examined using a systems analysis framework. Uses personal computers.
Course Activities: Oral and written projects, class discussion.
Course Note: EHH 260cd required.

EH 265c. Air Pollution
To be given 1993-94; offered alternate years. Lectures, seminars. Two 2-hour sessions each week. 2.5 credits. Dr. Spengler, Dr. First. Critically examines the federal and state laws governing air pollution. Reviews health effects, damage to animals, plants, and groundwater that may occur directly or by intermediate transport. Presents control, legal, and enforcement aspects.
Course Activities: Written and oral projects, class discussion.
Course Note: Minimum course enrollment of 9 students required.
TR 8:30 - 10:20; Room 209, III

EH 266d. Hazardous Waste
To be given 1993-94; offered alternate years. Lectures, seminars. Two 2-hour sessions each week. 2.5 credits. Dr. Spengler, Dr. First. Critically examines the federal and state laws governing hazardous wastes. Reviews health effects and damage to animals, plants, and groundwater that may occur directly or by intermediate transport. Presents control, legal and enforcement aspects.
Course Activities: Written and oral projects, class discussion.
Course Note: Minimum enrollment of 9 students required.
TR 8:30 - 10:20; Room 209, III

EH 267cd. Occupational Exposures Seminar
Seminars, case studies. One 2-hour session each week. 2.5 credits. Prof. Sherwood. Material for this course comes from the Industrial Hygiene Internship Program. The objective of the course is to refine communication skills.
Course Activities: Students present seminars on their recent internship and prepare posters on their work at the American Industrial Hygiene Conference and Exposition.
Course Note: EH 273ab Industrial Hygiene Internship required; ordinal only.
F 10:30 - 12:20; Room 209, III

EHE 268b. Respiratory Epidemiology (Department of Environmental Health and the Department of Epidemiology)
To be given 1993-94; offered alternate years. Lectures, case studies. One 2-hour session each week. 1.25 credits. Dr. Dockery. Reviews the epidemiology of chronic respiratory diseases. Demographic distribution and time trends of these diseases are presented. Known risk factors are discussed with particular attention to environmental hazards.
Course Note: EPI 200a or EPI 201a required.
R 1:30 - 3:20; Room 202, III

EH 269ab. Environmental Organic Chemistry
Lectures. Two 2-hour sessions each week. 5 credits. Dr. P.B. Ryan. Development of physical and chemical concepts related to the fate and transport of organic contaminants in the environment.
Course Activities: Six homework sets, mid-term and final examination, class participation.
Course Note: EH 261ab required; signature of the instructor required.
MW 8:30 - 10:20; Room 201, III

EH 271cd. Occupational and Environmental Radiation Protection
To be given 1993-94; offered alternate years. Lectures, demonstrations. One 2-hour session each week. 2.5 credits. Dr. Shapiro, Guest Lecturer. Covers the following topics: biological effects of radiation; radiation epidemiology; radiation protection standards and regulations; and laboratory, industrial, environmental and medical radiation protection.
Course Activities: Written and oral student projects, individual class presentations, class discussion.
Course Note: EH 261ab required or signature of instructor.
TBA

EH 273ab. Industrial Hygiene Internship
Field studies. Normal working hours of the company, plus that required for relevant reading. 20 credits. Prof. Sherwood, Intern Mentor. The student works in an industrial or similar workplace under the direction of a qualified and experienced industrial hygienist (a mentor). Generally, the first half of the six-month period is devoted to learning evaluation techniques (e.g., personal air sampling, direct reading instrumentation, ventilation measurements), and the second half to studying some specific hazard or problem in depth, and preparing material for presentation in the succeeding course, EH 267cd.
Course Note: Completion of first year of two-year Master's program in Environmental Health required; no auditors; ordinal only.
TBA

EH 274b. Introduction to Field Investigations
Lectures, laboratories. Two 1.5 hour-lectures and one 4-hour laboratory each week. 2.5 credits. Dr. P.B. Ryan. This course will give students an overview of designing, implementing, and analyzing environmental exposures in the field. Students will develop an original design stressing some respirable particle exposure with the potential for health impacts.
Course Activities: Group projects, oral presentations, individual final reports, and class participation.
Course Note: EHH 260cd, EH 261ab, BIO 200ab or equivalent required; lab or section time to be announced at first meeting; course enrollment is limited to 16 students; signature of instructor required.
MW 10:30 - 12:20; Room 203, III

EH 275d. Global Climate Change: Impact/Response
To be given 1993-94; offered alternate years. Lectures. Two 2-hour sessions each week. 2.5 credits. Dr. Yanagisawa, Dr. Spengler, Dr. Ozkaynak. To enable understanding of global climate change, this course provides the foundation of physical and chemical aspects of the global climate such as heat balance of the Earth and chemical properties of greenhouse gases. Geological and public health impacts due to the climate change will be discussed. To respond to the impacts, mitigation measures approached from technological and socio-economical viewpoints will be introduced. How global environmental problems and their potential risks are recognized in each country having different cultural backgrounds are reviewed and discussed using media publications. This mid-level course is intended primarily for students considering professions concerned with global environmental problems in various countries.
Course Activities: Oral group projects, two written individual project reports, class discussion.
Course Note: Minimum course enrollment of 6 students required; course enrollment is limited to 20 students; signature of instructor required.
MW 10:30 - 12:20; Room 212, III

[EHE 280cd.] Biomarkers in Occupational and Environmental Health (Department of Environmental Health and the Department of Epidemiology)
Not to be given 1993-94; offered alternate years. Lectures, seminars. One 2-hour session each week. 2.5 credits. Dr. Kelsey, Dr. Christiani, Dr. Monson. This course discusses the use of a wide variety of biomarkers applied to problems of exposure-related disease. The course will cover the use of biomarkers as measures of exposure, absorbed dose, biological effect and health outcome in acute and chronic disease states. Special emphasis will be placed upon the use of cellular and molecular biomarkers in epidemiology. The course will also address the use of biomarkers in the risk assessment process.
Course Activities: Lectures and seminars relating to the use of biomarkers in epidemiologic studies.
Course Note: Introductory biostatistics and epidemiology required; toxicology and environmental epidemiology are suggested; minimum course enrollment of 10 students required; course enrollment is limited to 25 students; signature of the instructor required.

HPE 284c. Decision Theory. (Department of Health Policy and Management and the Department of Environmental Health) (Course described under Health Policy and Management)

HPE 285b. Seminar on Risk Analysis (Department of Health Policy and Management and the Department Environmental Health) (Course described under Health Policy and Management)

EH 300 a,b,c,d,s. Tutorial Programs
Time and credit to be arranged. Members of the Department. An opportunity for tutorial work is offered for interested and qualified students or small groups of students. Arrangements must be made with individual faculty members and are limited by the amount of faculty time available. These programs are open to all students who wish to go beyond the content of the regular courses. Opportunities are provided for individual tutorial work in the fields of respiratory biology, respiratory epidemiology, occupational medicine, industrial hygiene and ventilation, aerosol technology, radiological health, nuclear medicine, solid waste management, air pollution control, and environmental health management.
Course Note: Completed tutorial contract is required at the time of registration; maximum of 5 credits per tutorial topic; pass/fail only; course enrollment requires the signature of the instructor.
TBA

EH 330e. Field Work
Supervised site visits and field research projects are available in medical, industrial hygiene, and environmental health departments of industries and governmental agencies. Students in the various programs in occupational health may receive one credit unit for one week of field work in the "e" period. Students participating in the industrial hygiene internship program receive 20 credits for field work associated with their internship and should register for the internship through EH 273ab.
Course Note: Pass/fail option only.
TBA

EH 350 a,b,c,d,s. Research
Time and credit to be arranged. Members of the Department. For doctoral candidates who have passed their school-wide Oral Qualifying Examination and who are undertaking advanced work along the lines of fundamental or applied research in the department. Research topics that may be undertaken under the direction of the faculty are listed below.

Course Note: Pass/Fail only; maximum of 20 credits; course enrollment requires the signature of the instructor.
TBA

Air Pollution
Dr. Burge, Dr. Dockery, Dr. First, Dr. T. Ford, Dr. Koutrakis, Dr. Ozkaynak, Dr. Rudnick, Dr. P.B. Ryan, Dr. Speizer, Dr. Spengler, Dr. Yanagisawa. Industrial gas cleaning, personal exposure monitoring, assessment of air pollution potential from simple and complex pollution sources, indoor air pollution, health effects of air contaminants, epidemiology, and global air pollution.

Biomechanics
Dr. Butler, Dr. Fredberg. Mechanics of connective tissues, cells, and biologic fluids.

Environmental Epidemiology
Dr. Burge, Dr. Dockery, Dr. Ford, Dr. Gold, Dr. Neas, Dr. O'Connor, Dr. Speizer, Dr. Spengler, Dr. Ware, Dr. Xu. Population-based studies of environmental agents, including air pollutants (outdoor and indoor), and drinking water contamination.

Environmental Health Management
Dr. Evans, Dr. J. Harrington, Dr. Hornig, Dr. P.B. Ryan, Dr. Spengler. Quantitative methods of environmental management, risk analysis, environmental standards, and criteria.

Environmental Microbiology
Dr. Burge, Dr. Ford, Dr. Milton. Studies in aerobiology and aquatic microbiology; exposure assessment and health effects of microbiological agents.

Industrial Hygiene
Dr. Burge, Prof. Burgess, Dr. Evans, Dr. Ford, Dr. Rudnick, Prof. Sherwood, Dr. Smith, Dr. Yanagisawa. Hazard evaluation and control for occupational groups; hazards include toxic materials and physical agents (noise and non-ionizing radiation). Ergonomic applications to job design.

Inhalation Toxicology and Cell Biology
Dr. Brain, Dr. Godleski, Dr. Kobzik, Dr. Milton, Dr. Paulauskis, Dr. Valberg, Dr. Warner. Biological responses to inhaled particles and gases, deposition and clearance mechanisms, macrophage biology, pathogenesis of lung injury.

Mathematical Physiology
Dr. Butler. Modeling of organ systems, experimental design.

Occupational Health
Dr. Burge, Dr. Christiani, Dr. Eisen, Dr. Ford, Dr. Kelsey, Dr. Hu, Dr. Milton, Dr. Monson, Dr. Robins, Dr. Smith, Dr. Xu. Epidemiologic and field studies, health hazard evaluation.

Radiological Health
Dr. Shapiro. Reduction of dose from sources of natural origin, radiation safety criteria and standards, control of radioactive contamination.

Physiology
Dr. Banzett, Dr. Butler, Dr. Chapman Dr. Drazen, Dr. Fredberg, Dr. Loring, Dr. Shea, Dr. Shore. Physiological theory, measurement of respiratory function, and structural correlates.

Hazard and Solid Waste Management
Dr. Evans, Dr. First, Dr. Ford, Dr. Spengler. Incineration of solid wastes, including municipal, radioactive, biological, and laboratory materials. Identification and risk assessment of chemical contaminants in air, water and soil.

Epidemiology

Note: Either EPI 200a or EPI 201a satisfies the school-wide requirement of an introductory course in epidemiology; however, individual programs may require one or the other.

EPI 200a. Introduction to Epidemiology
Lectures, seminars. Two 2-hour sessions each week. (Seminars are held during scheduled class time.) 2.5 credits. Dr. Cook. This course is an introductory-level course and covers the principles and methods used in epidemiologic research. This course is an alternative to EPI201a and is designed for students majoring in Epidemiology or Biostatistics, or for students who desire a more detailed introduction into the main issues encountered in the design, implementation, and analysis of epidemiologic studies.
Course Activities: Written assignments and a small-group project involving the development of a study proposal for presentation in class.
Course Note: Course enrollment is limited to 161 students; lab or section time to be announced at first meeting.
TR 10:30 - 12:20; Room G-1, III

EPI 201a. Principles of Epidemiology
Lectures, seminars. Two 1-hour sessions and one 2-hour seminar each week. 2.5 credits. Dr. M. Goldman, Dr. Stuver. Introduces the basic principles and methods of epidemiology. Lectures are complemented by seminars devoted to exercises or to the discussion of current examples of epidemiologic studies.
Course Activities: Class discussion, seminar participation, quiz, final examination.
Course Note: Credit is not given for both EPI 200a and EPI 201a.
TR 8:30 - 9:20; Room G-1, III
F 8:30 - 10:20; TBA

EPI 202b. Elements of Epidemiologic Research
Lectures, seminars. Two 2-hour sessions and one 2-hour seminar each week. 2.5 credits. Dr. Spiegelman, Dr. Trichopoulos. Introduces elements of study design, data analysis and inference in epidemiologic research. Principles and methods are illustrated with examples, and reviewed through homework and in-class exercises. May serve as an introduction to more advanced study or as a concluding course for those desiring a working knowledge of epidemiologic methods.
Course Note: EPI 200a or EPI 201a required; BIO 200ab or BIO 201ab required (concurrent enrollment permitted).
TR 10:30 - 12:20; Room G-1, III

EPI 203c. Design of Case-Control and Cohort Studies
Lectures. Two 2-hour sessions each week. 2.5 credits. Dr. Walker, Dr. Hsieh. Examines common problems in the design, analysis, and interpretation of cohort and case-control studies. Problems of exposure and disease definitions, time-dependent effects, confounding, and misclassification are considered in the light of data sources typically available. Relevant statistical methods are introduced but developed in detail only insofar as they affect study design.

Course Activities: Written group projects, class discussion.
Course Note: EPI 202b and BIO 200ab or signature of instructor required.
TR 10:30 - 12:20; Room 502, III

EPI 204d. Analysis of Case-Control and Cohort Studies
Lectures. Two 2-hour sessions each week. 2.5 credits. Dr. Hsieh, Dr. Neas. Develops the material presented in EPI 203c into the rationale and methodology for mathematical modeling of study parameters. Emphasizes Poisson and logistic regression.
Course Activities: Written group projects, class discussion.
Course Note: EPI 203c required.
TR 10:30 - 12:20; Room 502, III

EPI 205ab. Practice of Epidemiology
Seminars, tutorials, tutorial sessions during "a" period; one 2-hour seminar each week during "b" period. 2.5 credits for both periods. Dr. Stampfer, Dr. Rimm, Dr. Colditz. The seminars consist of student presentations of plans for collection and analysis of epidemiological data, with discussion by students and faculty. Preparatory work is done under tutorial arrangements with members of the faculty. The emphasis is on conceptual issues and not execution.
Course Activities: Individual student presentations, student and faculty critiques.
Course Note: Background in epidemiology is required; course enrollment is limited to 16 students; signature of instructor required indicating suitable background.
F 10:30 - 12:20; Room 201, III

EPI 207c. Advanced Epidemiologic Methods
Lectures. Two 2-hour sessions each week. 2.5 credits. Dr. Robins. Reviews a range of both classic and current readings pertaining to methodologic topics in epidemiology. Topics include: options in study design (subject selection, matching), confounding (definition and control), modeling (model selection, co-linearity, validity, and efficiency considerations), measurement error, estimation of direct and indirect effect, causal inference with time-dependent exposures and confounder, and selected analytic methods (exposure-response relation assessment, attributable fraction estimates). Background materials on each topic are summarized, followed by a student-led discussion.
Course Activities: Class discussion, homework, final examination.
Course Note: Signature of the instructor required.
MW 3:30 - 5:20; Room 201, III

EPI 208s. Introduction to Clinical Epidemiology
Lectures, seminars, case studies. Five 2-hour sessions each week. (Seminars are held during scheduled class time). 5 credits. Dr. Cook, Dr. Goldman, Dr. Lee. This course is an introductory-level course and covers the principles and methods used in traditional and clinical epidemiologic research through a series of lectures, exercises, seminars, workshops and presentations.
Course Activities: Written assignments, computer exercises, seminar discussion; each student is required to develop a study design that addresses a specific clinical problem and to present this proposal to the class.
Course Note: For participants in the Summer Program in Clinical Effectiveness only; no auditors; signature of the instructor required.
TBA

EPI 209d. Key Developments in Epidemiologic Methods
Seminars. Two 2-hour sessions each week. 2.5 credits. Dr. Maclure. Historic papers on quantitative methods are reviewed; also recent papers on similar topics. Topics include: occurrence fallacy; selection bias; control representativeness; estimating relative risk; quantifying confounding; interpreting logistic models; matching; attributable fraction; misclassification; meta-analysis; refutation. In seminars, students practice techniques for presenting a methodology paper to a journal club.
Course Note: EPI 202b or signature of the instructor required.
MW 1:30 - 3:20; Room 206, III

EPI 210c. Causal Thinking in Health Sciences
Seminars. One 2-hour sessions each week. 1.25 credits. Dr. Maclure. Covers purposes of causal statements and types of causal models in various health sciences. Topics include: influence diagrams; causal criteria; causal pies; causation of error; confounding; legal definitions; circular causation; blame and responsibility. A unifying paradigm: development of a methodology for the "Discussion" section of a research paper.
M 1:30 - 3:20; Room 206, III

EPI 211c. Reproductive Epidemiology
Lectures. One 2-hour session each week. 1.25 credits. Dr. M. Goldman. Applies the principles of epidemiology to diseases and disorders of reproduction in both women and men. Considers study design and methodology in studies of reproductive health. Lecture topics cover, infertility, abortion, reproductive hazards in the workplace, sexually-transmitted diseases (including AIDS), reproductive cancers, and premature menopause. Sessions combine lectures and class discussions.
Course Activities: Class participation, written project.
Course Note: EPI 200a or EPI 201a.
F 10:30 - 12:20; Room 202, III

EPI 212a. Epidemiology of Cardiovascular Diseases
Lectures. One 2-hour session each week. 1.25 credits. Dr. Stampfer, Guest Lecturers. Reviews the epidemiology of the chronic cardiovascular diseases. Demographic distribution and time trends of these diseases are presented, and known risk factors are discussed. The course is open to all students.
Course Note: Grades are based on short papers or student presentations.
R 1:30 - 3:20; Room 202, III

EPI 213c. Epidemiology of Cancer
Lectures. Two 2-hour sessions each week. 2.5 credits. Dr. Mueller, Dr. Trichopoulos. Reviews basic concepts and issues central to cancer epidemiology. Considers the descriptive epidemiology of cancer and discusses the implications of the biology of cancer for identification of risk factors. Examines the role of smoking, radiation, nutrition, and occupation. Selected malignancies are discussed. Each student prepares a review of the epidemiology of a specific cancer site.
Course Note: EPI 200a or EPI 201a required; EPI 251b is strongly recommended.
TR 1:30 - 3:20; Room 202, III

EPI 214d. Epidemiologic Analysis of Outbreaks and Infectious Diseases
Seminars, case studies. One 2-hour session each week. 2.5 credits. Dr. Freeman, Dr. Platt (HMS). Discusses the use of epidemiologic methods in analyzing outbreaks and investigating infectious diseases. Different types of problems and various methods of analysis are illustrated. Stresses literature review and practical methodology.
R 3:30 - 5:20; Room 213, III

EPE 215cd. Environmental and Occupational Epidemiology (Department of Epidemiology and the Department of Environmental Health)
Lectures, case studies. One 2-hour session each week. 2.5 credits. Dr. Dockery, Dr. Monson, Dr. Robins. This course has three objectives: to review methods used in evaluating the health effects of physical and chemical agents in the environment, to review available evidence on the health effects of such exposures, and to consider policy questions raised by the scientific evidence. Topics include: lectures on methodology, seminars on the review and criticism of current literature, and presentations by outside experts on the evaluation and impact of epidemiologic data.
Course Note: EPI200a or EPI201a, BIO200ab or BIO201ab required.
W 1:30 - 3:20; Room 502, III

NUE 216cd. Nutritional Epidemiology (Department of Nutrition and The Department of Epidemiology) (Course described under Nutrition)

EPI 217a. The Epidemiology of Major Psychiatric Disorders
Lectures. One 3-hour session each week. 2.5 credits. Dr. Tohen. Covers a range of readings from early classics to recent work on the occurrence and distribution of psychiatric illness. Describes the application of basic epidemiologic research designs to the study of psychiatric conditions. The course is an introductory course in the psychiatric epidemiology track and is primarily intended for master's and doctoral students interested in mental health research.
Course Activities: Class discussion, final paper, individual class presentations.
Course Note: Students should have an understanding of basic epidemiologic research methods; background in introductory statistics is also helpful; EPI 200a or EPI 201a and BIO 200a or BIO 201a required (concurrent enrollment permitted).
T 3:30 - 6:20; Room 204, III

EPI 218b. Risk Factors in Psychiatric Epidemiology: Genetics and Environment
Lectures. One 3-hour session each week. 2.5 credits. Dr. Zahner, Dr. Santangelo, Dr. Tsuang. Reviews research methodology and empirical studies of genetic and psychosocial risk factors for psychiatric disorders. Topics include: genetic research designs; twin studies; perinatal risk factors; gender and mental health; and psychosocial risk factors such as social class, life stress, social support, and coping. The course is an introductory course in the psychiatric epidemiology track and is primarily designed for master's and doctoral students interested in mental health research.
Course Activities: Class discussion, final examination.
Course Note: Students should have an understanding of the major forms of psychopathology and a basic knowledge of human genetics and epidemiologic research methods; background in introductory statistics is also helpful; EPI 200a or EPI 201a and BIO 200a or BIO 201a required (concurrent enrollment permitted).
W 8:30 - 11:20; Room 209, III

EPI 219c. Concepts and Methods in Psychiatric Epidemiology
Lectures, laboratory/practice session. One 2-hour lecture session each week, and one 1-hour laboratory/practice session weekly. 2.5 units. Dr. Zahner, Dr. Buka. Presents the application of basic epidemiologic and psychometric concepts and methods in psychiatric research. Topics include: measurement theory, reliability, validity, screening, and diagnostic classification procedures, as they specifically relate to psychiatric research. The course is emphasizes applications (rather than theory) of measurement and is primarily intended for students interested in conducting mental health research.
Course Activities: Class discussion; final paper; laboratory group and individual written and oral projects.
Course Note: Students should have an understanding of the major forms of psychopathology; basic epidemiologic research methods, and introductory statistics; EPI200a or EPI201a and BIO 200ab or BIO 201ab required; lab or section time to be announced at first meeting.
W 8:30 - 10:20; Room 209, III

EPI 220d. Psychiatric Screening and Diagnostic Tests
To be given in 1993-94; offered alternate years. Lectures, seminars, outside practicum involving interviews. 2-4 hour practicum each week. 2.5 units. Dr. Murphy. Focuses on interview schedules designed to identify psychiatric disorders and to provide diagnoses. Topics include the history of such instruments as well as their construction, reliability, validity, and appropriateness for different kinds of studies. Practical experience in administering and analyzing the response to psychiatric diagnostic interviews and screening measures plays a central role in the course. The course is primarily designed for students considering a career in mental health research. The course is an applied, mid-level course in the psychiatric epidemiology track.
Course Activities: Class discussion, verbal and written reports on practicum experience.
Course Note: Students should have an understanding of the major forms of psychopathology; basic epidemiologic research methods and introductory statistics; EPI 217a or EPI 218b and EPI219c and signature of the instructor required; lab or section time to be announced at first meeting.
W 8:30 - 10:20; Room 206, III

EPI 221b. Pharmacoepidemiology
Lectures. Two 2-hour sessions each week. 2.5 credits. Dr. Walker. Within the framework of formal epidemiologic analysis, this course covers inference about the effects of pharmaceuticals from case reports, case series, vital statistics and other registration schemes, cohort studies, and case-control studies. Decision-making with inadequate data is examined from the perspectives of manufacturers and of regulators. Students are graded on the basis of group projects. This course is intended primarily for students wishing to pursue a career in the pharmaceutical industry or in national regulatory bodies, but may have more general interest as an applied mid-level course with a heavy methodological emphasis.
Course Activities: Written and oral group projects, individual class presentations, class discussion.
Course Note: Elementary knowledge of epidemiology; basic understanding of drug use and nomenclature is helpful.
T 1:30 - 3:20; Room 204, III
R 1:30 - 3:20; Room 201, III and Room 204, III

EPI 222d. Genetic Epidemiology of Diabetes and its Complications
Seminar, case studies, laboratories. One 2-hour session each week and one 2-hour laboratory session each week. 2.5 credits. Dr. Krolewski, Dr. Warram. Uses the genetics of diabetes and its complications, together with the descriptive epidemiology of these conditions, will be used to illustrate the process of generating etiologic hypothesis which can be studied by the methods of genetic epidemiology. Techniques of molecular genetics relevant to epidemiologic studies will be reviewed and demonstrated. Data sets which include genotype information will be analyzed with an emphasis placed on the examination of various gene/environment interaction.
Course Note: EPI 202b required; lab or section time to be announced at first meeting.
F 1:30 - 3:20; Room 212, III

MCE 223b. Childhood Mental Disorders: Public Health Perspectives (Department of Maternal and the Department of Child Health and Epidemiology) (Course described under Maternal and Child Health)

EPI 224b. Epidemiology of AIDS in Developing Countries
Lectures. Two 2-hour sessions each week. 2.5 credits. Dr. Hunter, Dr. Lallemant. Discusses epidemiological methods appropriate for the study of the HIV epidemic and other chronic viral infections in developing countries. Describes methods for etiologic research on, and development and assessment of interventions against, these diseases. Presents practical problems in implementing research in developing countries, as well as ethical and cost-effectiveness issues of different research strategies.
Course Note: BIO 200ab or BIO 201ab required; EPI 200a or EPI 201a required.
MW 3:30 - 5:20; Room 213, III

EPI 226b. Managing Epidemiologic Data
Lectures. One 2-hour session each week. 1.25 credits. Dr. Hunter. This course teaches general principles of data management for epidemiologic surveys and analytic studies. Students use a microcomputer package - EPIINFO - to replicate the experience of conducting a case control study from questionnaire design through to analysis.
Course Note: Course enrollment is limited to 30 students; signature of the instructor required.
F 1:30 - 3:20; Room 204, III

EPI 227d. Principles of Screening
Lectures, seminars, case studies. Two 2-hour sessions each week. 2.5 credits. Dr. Colditz, Dr. Kawachi. The aim of this course is to provide a basic understanding of the principles of screening. Particular emphasis is placed on screening for cancer and applications in a number of other settings. Students will develop strategies to evaluate new screening tests and identify a screening policy which they will critique through the time frame of the course.
Course Activities: Class participation in seminars and discussion, class assignments, six 1-3 page papers, one 10-15 page paper.
Course Note: Course enrollment is limited to 25 students; signature of the instructor required.
MW 3:30 - 5:20; Room 201, III

EPI 230c. Methods for Health Care Utilization Research
Seminars. One 2-hour session each week. 1.25 credits. Dr. Maclure. Covers epidemiologic methods for studying the causes of trends in health care utilization. Topics include: special measures of occurrence and study designs; theory and tools for record linkage and browsing large data sets; guidelines for inference from weak data; common fallacies and biases.
W 1:30 - 3:20; Room 206, III

EHE 235ab. Scientific Basis of Occupational Health Regulations(Department of Environmental Health and the Department of Epidemiology) (Course described under Environmental Health)

EPI 236s. Advanced Methods in Clinical Epidemiology
Lectures, seminars. Ten 2-hour sessions each week. (Seminars are scheduled during regular class time) 5 credits. Dr. Cook. This course examines various design, measurement and analytic issues encountered in clinical research. Lectures and workshops examine the methodologic issues involved in the development of health status measures, the analytic methods that are used to assess the reliability and validity of these measures, and the statistical techniques that are used to assess change in these measures over time. Additional lectures address the issues involved in the creation and validation of clinical prediction rules.
Course Activities: Written assignments, computer exercises, small-group project involving the development and evaluation of an instrument to measures one aspect of health.
Course Note: Course enrollment is limited; no auditors; signature of the instructor required.
TBA

EPI 241d. Clinometrics
Seminars, lectures. Two 2-hour sessions each week (seminars are held during scheduled class time). 2.5 credits. Dr. Cook, Dr. Lee. This course examines the methodologic issues related to measures of health status that are encountered in clinical research, including generic and disease-specific measures of health, quality of life, functional status, severity of disease, and co-morbidity. Lectures provide an overview of some the existing instruments that are used to measure these phenomena and additional lectures address the methodologic approaches and techniques that are used to evaluate the reliability and validity of these instruments.
Course Activities: Written assignments, computer exercises, small-group project involving the development and evaluation of an instrument to measure one aspect of health.
TR 1:30 - 3:20; Room 202, III

EPI 242ab, cd. Seminar in Clinical Epidemiology
Seminar. One 1.5-hour sessions each week. 1.25 credits per semester. Dr. Goldman, Dr. Lee, Dr. Cook, Dr. Orav. Through a series of presentations by guest speakers, students are exposed to a number of clinical research projects and to a variety of research designs and analytic strategies. Each presentation is followed by a short summary by a faculty member who emphasizes a methodologic issues pertinent to that presentation.
Course Activities: Student presentation or written evaluations of other presentations.
Course Note: Must register in each appropriate semester. Grade received only after completing both "ab" and "cd" periods.
F 7:45 a.m. - 9:15 a.m.; Club Room, Vanderbilt Hall, Longwood Avenue

EPI 251b. Molecular Epidemiology of Cancer
Lectures, seminars, case studies. One 2-hour session each week. 1.25 credits. Dr. Li. This course is an introductory overview of the molecular genetics and epidemiology of cancer, with emphasis on use of new laboratory techniques in epidemiologic studies. Also discussed will be the application of epidemiologic methods to the analysis of clinical practices in cancer.
Course Note: EPI 200a or EPI 201a required; signature of the instructor required if prerequisite is not met.
T 1:30 - 3:20, Room 201, III

EPI 252d. Epidemiology of Virus-Associated Malignancy
Lectures, seminars, case studies. One 2-hour session each week. 1.25 credits. Dr. Mueller. This course reviews the epidemiology and public health impact of virus-associated malignancy. The role of host response and the use of serology and viral probes as risk markers are discussed. A related disease of unknown etiology is discussed as a case study.
Course Note: EPI 200a or EPI 201a and EPI213c required.
T 1:30 - 3:20; Room 212, III

PIE 255c. AIDS: Responding to a Global Epidemic (Department of Population and International Health and the Department of Epidemiology) (Course described under Population and International Health)

EHE 268b. Respiratory Epidemiology (Department of Environmental Health and the Department of Epidemiology) (Course described under Environmental Health.)

[EHE 280cd.] Biomarkers in Occupational and Environmental Health (Department of Environmental Health and the Department of Epidemiology) (Course described under Environmental Health)

EPI 290s. Diagnosis of Major Psychiatric Disorders in a Clinical Setting
Field experience. Two 2-hour sessions and one 1-hour individual meeting each week for eight summer weeks. 2.5 credits. Dr. Tohen, Dr. Vuckovic 1(HMS). A summer rotation in a clinical psychiatric setting (McLean Hospital) designed to familiarize the student with a contemporary biomedical approach to psychiatric practice, with an emphasis on the diagnosis of major psychiatric disorders and clinical epidemiologic research. Teaching and readings will focus on diagnostic criteria for schizophrenia, bipolar disorder, major depression, and other psychotic conditions. The student will participate in rounds and meet regularly with the psychiatrist-in-charge and psychiatric residents to discuss inpatient evaluations. In addition, students will meet with clinical investigators to discuss topics in clinical research and neuroscience. Students may also design a supplemental summer research tutorial (EPI 300s) involving supervised readings and/or laboratory experience in an ongoing clinical epidemiologic research project.
Course Note: EPI 217a recommended; primarily intended for students in the Psychiatric Epidemiology and Biostatistics training program; course enrollment is limited to 3 students; signature of the instructor required.
TBA

EPI 300 a,b,c,d,e,s. Tutorial Programs
Time and credit to be arranged. Members of the Department. An opportunity for tutorial work is offered for interested and qualified students or small groups of students. Arrangements must be made with individual faculty members and are limited by the amount of faculty time available. These programs are open to all students who wish to go beyond the content of the regular courses.
Course Note: Completed tutorial contract is required at the time of registration; maximum of 5 credits per tutorial topic; pass/fail only; course enrollment requires the signature of the instructor.
TBA

EPI 350 a,b,c,d,s. Research
Time and credit to be arranged. Members of the Department. For doctoral candidates who have passed their school-wide Oral Qualifying Examination and who are undertaking advanced work along the lines of fundamental or applied research in the department.
Course Note: Pass/Fail only; maximum of 20 credits; course enrollment requires the signature of the instructor. Research topics that may be undertaken under the direction of the faculty are listed below.
TBA

Neoplastic Diseases
Dr. M. Goldman, Dr. Hsieh, Dr. Hunter, Dr. Maclure, Dr. Monson, Dr. Mueller, Dr. Trichopoulos, Dr. Willett

Cardiovascular Disease
Dr. Stampfer, Dr. Maclure, Dr. Ascherio

Clinical Epidemiology
Dr. L. Goldman, Dr. Cook

Molecular and Genetic Epidemiology
Dr. Krolewski, Dr. Li

Environmental Epidemiology
Dr. Monson, Dr. M. Goldman

Occupational Epidemiology
Dr. Monson

Infectious Diseases
Dr. Freeman

Epidemiologic Methods
Dr. Walker, Dr. Hsieh, Dr. Cook, Dr. Spiegelman, Dr. Robins, Dr. Maclure

Nutritional Epidemiology
Dr. Willett, Dr. Stampfer, Dr. Colditz, Dr. Ascherio

Virus-Associated Chronic Disease/AIDS
Dr. Hunter, Dr. Mann, Dr. Mueller

Psychiatric Epidemiology
Dr. Tsuang, Dr. Murphy, Dr. Tohen

Pharmacoepidemiology
Dr. Walker

Reproductive Epidemiology
Dr. M. Goldman

Health Policy and Management

BIH 203b, 203c, 203d. Statistical Methods for Health Policy and Management (Modules I, II, III) (Department of Biostatistics and the Department of Health Policy and Management) (Course described under Biostatistics)

HPM 204d. Meta-Analysis of Clinical Trials and Their Impact on Medical Efficiency
Seminars. One 3-hour session each week. 2.5 credits. Dr. Chalmers, Members of the Department. Designed as a follow-up to BIO 214c. Concerned with the place of clinical trials in the practice of preventive, diagnostic, and therapeutic medicine. Students learn to evaluate, conduct, coordinate, and combine clinical trials. Related tutorials are conducted throughout the year. Students conduct meta-analysis in a

field of their choice. Guidance and collaboration are given in searching literature for RCTs on diagnostic evaluations, gathering and analyzing data, and preparing abstracts for presentation at national meetings and publication of manuscripts in peer-review journals.
Course Note: An interest in the application of the scientific method to the prevention, diagnosis, and treatment of disease is required.
F 10:30 - 12:20; Room 204, III

HPM 205ab. Economic Analysis for Public Health
Lectures. Two 1.5-hour sessions each week. 5 credits. Dr. Hemenway. Provides an introduction to the basic principles of economics and economic analysis, particularly as they apply in the public health field. A systematic introduction to microeconomic theory including the determinants of supply and demand, the theory of markets, and the concept of economic efficiency. Specific topics in health care economics include the demand for health care, insurance, and the market for physician services.
Course Note: May not be taken for credit by students who previously have taken HPM 206ab.
TR 10:30 - 12:20; Room 502, III

HPM 206ab. Economic Analysis
Lectures, seminars. Three 1.5-hour sessions each week. 5 credits. Dr. Hemenway. Designed to bring students to an intermediate-level understanding of microeconomic theory. Emphasizes the uses and limitations of the economic approach.
Course Note: May be taken for credit by students who previously have taken HPM 205ab only with the signature of the instructor.
MWF 1:30 - 3:20; Room G-1, III

HPM 207ab. Econometrics for Health Policy
Lectures. Two 2-hour sessions each week. 5 credits. Dr. Latimer. This course provides students with an understanding of basic econometric concepts and methods commonly used in health policy research. Special attention is given to modeling and model specification issues. Articles from the health policy literature and computer data exercises provide a context for discussion of the methods. Prepares students for a fuller understanding of the material covered in HPM 208cd.
Course Note: Some prior coursework in statistics is necessary; signature of the instructor required indicating suitable background.
MW 8:30 - 10:20; Room 212, III

HPM 208cd. Health Care Regulation and Planning
Lectures. Two 2-hour sessions each week. 5 credits. Dr. Swartz. Examines issues under discussion for U.S. health care reform: health insurance, financing, methods for controlling health care costs, incentives for hospitals and physicians, quality of care, and long-term care. Competitive versus regulatory approaches are explored, as well as the role of government and the private sector. The distributional consequences of various programs and methods receive special focus. Analytical exercises such as estimating costing-out the consequences of cost-control mechanisms or taxes to raise revenues for health care will be required.
Course Note: HPM 206ab or signature of the instructor required.
MW 10:30 - 12:20; Room 201, III

HPM 209b. Law for Public Health Professionals
Lectures. Two 2-hour sessions each week. 2.5 credits. Dr. Brennan, Dr. Parmet, Dr. Lazzarini. Introduces legal issues for public health professionals. The first half emphasizes issues in traditional public health control of disease outbreaks, such as police power of the state, constitutional restrictions thereof, quarantine issues, and confidentiality of patient records. The AIDS epidemic and the related tuberculosis resurgence will be used as illustrative examples. The second half of the course will expand to consideration of a broader set of legal issues that arise in regulation and oversight of health care providers and institutions. Topics will include legal authority for rate setting and cost control, discipline of providers, insurance law, and malpractice litigation.
TR 10:30 - 12:20; Room 202, III

HPM 210d. Medical Malpractice and Risk Management
Lectures. Two 1.5-hour sessions each week. 2.5 credits. Mr. Moulton. Focuses upon the development, implementation, and evaluation of risk management programs and legislative reforms in patient compensation plans. Attention is given to medical and hospital malpractice experience, key legal decisions in the area, and legislative reform movements setting up arbitration, screening panels, tort-law changes, no-fault mechanisms, etc. Emphasizes the interrelationship of quality of care standards and quality assurance to malpractice vulnerability and risk management programs.
TR 10:30 - 12:20; Room 203, III

HPM 211cd. Research Seminar in Law and Public Health
Lectures. One 2-hour session each week. 2.5 credits. Dr. Brennan, Dr. Akula, Dr. Lazzarini. Provides an opportunity for legally trained students in the Program in Law and Public Health and other qualified students to study in-depth issues in public health and the law. Concentrates on controversial and topical issues in health law, such as the role of ERISA in health care regulation, the impact of the Americans with Disability Act on state cost control plans, the legal structure of Health Plan Purchasing Cooperatives, the evolution of safe harbors for conflict of interest situations, and current issues of antitrust litigation. The seminar is the focus for a legal research paper on a topic of health law determined by the student and instructors.
Course Activities: Discussions, and student presentations.
Course Note: Signature of the instructor required.
T 8:30 - 10:20; Room 203, III

HPM 212cd. Advanced Environmental Law: Hazardous Substance Litigation and Regulation
Lectures. One 2-hour session each week. 2.5 credits. Dr. Brennan, Dr. Hashimoto. Addresses the legal control of hazardous substances. Widespread, yet difficult to identify, damages inflicted by environmental exposures to hazardous substances result from a dynamic interplay between regulatory agencies and courts. While exploring both regulatory and common law approaches, we will ask the critical normative and prescriptive question: Which approach is better?
F 1:30 - 3:20; Room 204, III

PIP 213d. Management Information Systems for Third World Health Systems (Department of Population and International Health and the Department of Health Policy and Management) (Course described under Population and International Health)

MCP 215cd. Planning and Evaluation of Public Health Programs (Department of Maternal and Child Health and the Department of Health Policy and Management) (Course described under Maternal and Child Health)

HPM 216ab. Law, Economics and Ethics of Health Care, Part I
Lectures. One 2-hour session each week. 2.5 credits. Dr. Brennan. Concerns the legal issues that occur in the doctor-patient relationship. Covering issues such as informed consent, conflicts of interest, reform of medical malpractice law, confidentiality, and right to die.
Course Note: Signature of the instructor required.
R 3:30 - 5:20; Room 502, III

HPM 217cd. Law, Economics and Ethics of Health Care, Part II (Cross-listed at HLS as Health Care Institutions)
Lectures. Two 1.5-hour sessions each week. 5 credits. Dr. Brennan. Overviews the law of health care institutions, emphasizing recent developments. Topics will include new payment methods and insurance forms, antitrust litigation, challenges to not-for-profit status, the influence of the Employee Retirement Income Security Act of 1974 on medical care, rationing mechanisms, and the role of health plan purchasing cooperatives in the future of medical care. Emphasizes the structural aspects of medical care.
Course Note: Signature of the instructor required.
MT 2:30 - 4:00; TBA at HLS

PIP 218c. Human Rights for Public Health Practitioners (Department of Population and International Health and the Department of Health Policy and Management) (Course described under Population and International Health)

HPM 219a. Financial Transactions and Analysis
Lectures. Three 2-hour sessions each week. 2.5 credits. Dr. Kane. This is an intensive course which introduces concepts of financial accounting for the non-accountant user of financial information. Basic accounting transactions, statement preparation, concepts of accrual accounting, accounting for capital, and fund accounting are presented in the first half of the course. The second half focuses on statement analysis in a variety of decision-making situations common to health care organizations.
Course Note: Completion of tutorial and Anthony's Essentials of Accounting before class begins. (Instructions will be distributed during fall semester orientation week); course enrollment is limited to 60 students.
MWF 10:30 - 12:20; Room 502, III

HPM 220b. Financial Management and Control
Lectures, case studies. Three 2-hour sessions each week. 2.5 credits. Mr. Siegrist. The course is designed to introduce students to cost accounting and management control concepts and uses for health service organizations. The first part of the course develops a basic knowledge of cost accounting, including full and differential costing techniques. The remainder of the course focuses on management control structure and process and addresses topics such as responsibility accounting, budgeting, reporting and variance analysis.
Course Note: HPM 219a required; signature of the instructor required.
MWF 10:30 - 12:20; Room 202, III

HPM 221ab. Management in Public Health in Industrialized Countries
Lectures, seminars, case studies. Two 2-hour sessions each week. 5 credits. Dr. Roberts. Introduces the management of health delivery organizations in industrialized countries. Topics include: organizational issues, financial management, cost accounting, management control systems, and institutional strategy. Combines cases, lectures, and speaker presentations, supplemented by topical readings, as a vehicle for analyzing management problems and evaluating alternative solutions. Introduces relevant managerial concepts and theories.
TR 1:30 - 3:20; Room G-1 III

HPM 228cd. Law and Management of Health Care Competition
Lectures. Two 2-hour session each week. 5 credits. Mr. Moseley. Examines the management and legal issues surrounding the new organizational structures and relationships emerging in the health field as a result of increased competition, cost control mechanisms, and the latest health care reform proposals. Topics include formation of alternative delivery systems; negotiating contracts with alternative delivery systems; Medicare/Medicaid fraud and abuse; avoiding and defending prepayment review and overpayment claims by third-party payers; forming and managing joint ventures between hospitals and physicians; other devices for building physician-hospital relationships; strategic planning in medical staff credentialing alternative dispute resolution of conflicts in the health care field; negotiating physician contracts with hospitals—as employees and as independent contractors; choosing an organizational structure for a medical practice; and legal liability of governing board members and hospital administrators.
WF 3:30 - 5:20; Room 202, III

HPM 229cd. Legal Aspects of the Regulation of Health Care
Lectures. One 2-hour session each week. 2.5 credits. Dr. Brennan, Mr. Hyams, Mr. Green. Examines the laws, regulations and methods used by government, quasi-public and private entities to regulate providers, other than through economic regulations and malpractice litigation. Entities examined include: federal government, state licensure and disciplinary boards, hospitals, HMOs, nursing homes, medical and specialty societies.
F 8:30 - 10:20; Room 203, III

HPM 230cd. Managing People in Health Care Organizations
Seminars. One 3-hour session each week. 5 credits. Mr. Moseley. Explains the basic systems and strategies for managing human resources in health care delivery organizations. Studies the basic principles of recruiting ancillary and professional staff (particularly nurses and physicians), managing and supervising their job performance, correcting the problems they present (absenteeism, substance abuse), and when necessary firing them. Stresses the role of labor unions in hospital operations, the management of medical staff relations, and the downsizing of hospital work forces.
F 8:30 - 11:20; Room 212, III

HPM 231c. Competitive Strategy Determination
Case studies. Two 2-hour sessions each week. 2.5 credits. TBA. Focuses on the conceptual framework needed to plan for the long-term viability of health care (and other) organizations. Using selected readings and case studies of both health care and non-health care organizations, students will learn to appreciate the concepts of competitive strategy and competitive advantage primarily through practice in analysis. The objective is to provide students with the conceptual tools and the practical skills to enable them to formulate and evaluate organizational strategy.
MF 8:30 - 10:20; Room 209, III

HPM 232c. Operations Management in Service Delivery Organizations
Case studies. Five-week course: Three 2-hour sessions each week for five weeks. 2.5 credits. Dr. Pliskin. Examines the special problems entailed in designing, producing, marketing, and delivering services, and explores how the specific tasks faced by managers vary across types of service organizations. Focuses on key operational tasks involved in optimizing performance. Links between operations, human resource, and marketing functions in service of businesses are examined in depth.
MWF 8:30 - 10:20; Room 206, III

HPM 233d. Strategic Marketing Management in Health Systems
Seminars, case studies, lectures. Two 2-hour sessions each week. 2.5 credits. Mr. Wasek. Examines marketing within a strategic framework across the public and private sectors, domestic and international health systems, and social marketing contexts. Marketing management, research, and strategy techniques are discussed and applied to program design, business planning, and implementation issues. Course emphasizes analytic skills development in marketing.
WF 10:30 - 12:20; Room 202, III

HPM 234d. Managing in Health Organizations
Lectures, case studies. Two 2-hour sessions each week. 2.5 credits. Mr. Cannon. This course provides a review of the essential tasks, functions and skills of general managers. Case discussions and exercises will expose students to practical skills employed by general managers in health organizations such as the art of negotiation, systematic approaches to personnel selection, developing consensus for organizational priorities, making good use of consultants and middle management, and diagnosing problems and allocating resources.
TR 8:30 - 10:20; Room 206, III

HPM 238b. Managing Management Information Systems
Lectures. Two 2-hour sessions each week. 2.5 credits. Dr. Glaser. Examines issues related to the effective management of information technologies and the information systems function. The focus is on information systems planning, system evaluation, selection and implementation, information system policies and management mechanisms, and management information systems and evaluation of new information technologies. Uses case method instruction and role playing, supplemented by topical readings.
TR 1:30 - 3:20; Room 212, III

HPM 239b, cd. Applied Financial Analysis of Hospitals
Lectures. One 2-hour session each week. 1.25 credits for "b" period; 2.5 credits for "cd" semester. Dr. Kane. In this applied skill-building course, students are assigned a set of hospital financial statements to convert to a LOTUS standardized format, build a data base with financial and other hospital-specific variables, convert the data to a SAS file, analyze a specific research question using PC-SAS, and write and present findings. Research questions vary in response to outside agencies' requests, major public health issues, or special interests of students. Course provides the opportunity to apply skills introduced in HPM 219a and to participate in a group research project.
Course Note: HPM 219a required; HPM 239b is a prerequisite for HPM 239cd; student must register in appropriate semester for each course; grades will be given at the end of "b" period and at the end of "cd" period; signature of the instructor required.
TBA

PIP 240d. Political Economy of International Health Policy (Department of Population and International Health and the Department of Health Policy and Management) (Course described under Population and International Health)

HPM 241ab. Health Policy in the United States (Cross-listed as KSG-HCP-100)
Lectures. Two 1.5-hour sessions each week. 5 credits. Dr. Feldman. Examines the goals of health policy and alternative means for achieving those goals. The current performance of the health care system is discussed, with special emphasis on the shifting health needs of the population, the growing cost of health services, and the equity of the health care system. A review of the important actors in the health care system is the basis of a systematic examination of alternative policy strategies.
TR 2:30 - 4:00 at KSG

HPC 242b. Strategies for Change in Health (Department of Health Policy and Management and the Department of Maternal and Child Health)
Lectures. Two 2-hour sessions each week. 2.5 credits. Dr. Blendon, Dr. Feldman. Focuses on development of strategies to influence public policy in order to improve the health of populations. Topics include: the legislative process, the courts, administrative and legislative bodies, the media, public opinion, advocacy groups, policy research, and other avenues to effect change in health care and health care outcomes. Guest lecturers teach practical skills that will aid students in improving their effective use of these institutions to influence the formation of public policy.
MW 10:30 - 12:20; Room 502, III

HPM 243c. Health Economics: Economic Analysis of the Health Care System
Lectures. Two 2-hour sessions each week. 2.5 credits. Dr. Hsiao. Introduces health economics, using economic analysis to examine major health care financing and delivery issues, and the development of policies and programs designed to address them. Topics include: health care financing, health care access and utilization, control of cost inflation, market structure, competition, and national health plans.
Course Note: HPM 205ab or HPM 206ab; or signature of the instructor required indicating suitable background.
TR 10:30 - 12:20; Room G-1, III

HPM 244d. Pharmaceutical and Biotechnology Industries: Public Policy and Regulatory Issues
Seminars, case studies. One 2-hour session each week. 1.25 credits. Mr. Norris. This course analyzes public policy and legal issues in the important health care industries of pharmaceutical and biotechnology in the U.S. and worldwide. Research and development of new biomedical products is stressed. Regulatory programs for new product development, the ethics of clinical investigation, and the ethics of conflict of interest are also examined.
W 1:30 - 3:20; Room 201, III

HPM 245d. Leadership in Public Health
Lecture, laboratories. One 2-hour session each week, eight 2-hour labs. 2.5 credits. Dr. Prothrow-Stith, Dr. Blendon. This course responds to recent criticism by the Institute of Medicine that public health schools are failing to train professionals to work in health agencies. It provides students with concrete skills needed to fill leadership positions in health. Topics include: public speaking, articulation of goals, negotiation, budget development, and constituency building.
Course Note: Recommended to follow ID 250a and HPM 242c; students should demonstrate an interest in careers in public leadership.
T 8:30 - 12:00; Room 202, III

HPM 246abcd. Seminar In Health Policy (Cross-listed as KSG-HCP-299y and FAS-HP-2000)
Seminars. One 2-hour session each week. 2.5 credits. Dr. Newhouse, Dr. Staiger. Topics covered will include the financing and organization of health care, medical manpower, medical malpractice, technology assessment, prevention, mental health, long-term care, and quality of care.
Course Note: Required for doctoral candidates in the department of Health Policy and Management; signature of the instructor required for those who are not doctoral candidates in the department of Health Policy and Management; the course is a half course (meets throughout the year) at Kennedy School of Government.
R 4:00 - 6:00 p.m.; TBA at KSG

[HPM 247d.] Injuries and Public Policy
Not to be given 1993-94; offered alternate years. Seminars, case studies, lectures. One 3-hour session each week. 2.5 credits. Dr. Hemenway. Introduces students to the problems of injury from a

social science perspective. Discusses and analyzes approaches to understanding the problem and policies to mitigate the consequences of both accidental and intentional injury. Specific categories of injury, such as fires, violence, and motor vehicle collisions are examined in detail.

HPM 248cd. Issues, Special Interests, and Health Care Reform. (Cross-listed as KSG-HCP-280)
Seminars. One 2-hour session each week. 2.5 credits. Dr. Blendon, Dr. Newhouse. Examines key issues in the health care system as they affect doctors, hospitals, insurers, governments, and the public through the perspective of business and labor organizations. Analyzes the roles of labor and management, their interactions on benefit policies and collective agreements, and their impact on issues of public policy concern. Student projects examine the business and labor perspectives on proposals for health care system reform.
Course Note: Course enrollment is limited to 20 students; signature of the instructor required.
M 4:00 - 6:00; TBA at KSG

HPM 249cd. Development of Federal Health Policy
Seminars, case studies. One 2-hour session each week. 2.5 credits. Dr. Calkins, Dr. Nuzzo. Discusses the interplay of forces, both internal and external to government, which influences federal health policy decisions. Describes the actors and policy development process. Develops skills in the following areas: policy analysis; writing of memoranda, testimony, and speeches; media relations. Draws on readings from the health care and political science literature.
M 3:30 - 5:20; Room 206, III

HPM 250cd. Designing a New Health Care System for the United States
Seminars. Two 2-hour sessions each week. 5 credits. Mr. Moseley, Dr. Blumenthal. Teams of student and consultants will prepare detailed proposals for the creation of a new health care system for the United States. In the process, the students will gain a comprehensive, integrated familiarity with the key decision makers, institutions, political forces, financial flows and vested interests in the existing system. The students will be given extensive background literature and data; they will conduct their own research; they will hear guest speakers from each sector of the health care system; they will prepare progress reports; they will share their research and their thinking with other teams; and they will make a formal presentation of their proposals to a panel of health care authorities.
MW 10:30 - 12:20; Room 206, III

HPC 251d. Violence Prevention: Issues and Controversies (Department of Health Policy and Management and the Department of Maternal and Child Health)
Lectures, seminars. One 2-hour sessions each week. 1.25 credits. Dr. Prothrow-Stith, Dr. Earls. Cover the public health approach to violence prevention and the resulting issues and controversies. The genetic, biologic, psychologic, family, community and societal issues will be discussed with an aim toward presenting a working theoretical model for understanding and preventing violence. The usefulness of public health research and prevention strategies will be analyzed.
Course Activities: Students will be required to develop a 20 page paper on one aspect of the course discussion.
Course Note: Students interested in injury or specifically in intentional injury should attend.
R 12:30 - 2:20; Room 203, III

HPM 252ab. Scientific Bases of Health Care Policy (Cross-listed as FAS-HP-2200 and at KSG as TBA)
Seminars. One 2-hour sesions each week. 2.5 credits. Dr. Maher, Dr. Blendon, Dr. Brandt, Dr. Clery, Dr. Levine. Five social sciences applied to health care policy. Topics include: theoretical perspectives, measurement methods, research strategies, and core literature relevant to determinants of health behavior and its impacts on health service delivery. Attention to the history, politics, and social organization of medical services, and differences between individual and collective representations of health care.
Course Note: Open to undergraduates with signature of the instructor.
M 4:00 - 6:00 p.m.; TBA at KSG

HPM 253s. Quality Improvement in Health Care
Lectures, seminars. Sixteen 1.75-hour sessions during the month of July. 2.5 credits. Dr. Berwick, Dr. James, Mr. Godfrey. Explore the theoretical foundations of quality improvement, with a strong emphasis on applications in clinical settings. Students will learn basic principles of statistical process control, improvement projects, systems thinking, and effective teamwork as these principles apply to improvement efforts.
Course Activities: Students will develop, carry out, and report on a "personal improvement project" based on these same principles.
TBA

HPM 254d. Functional Outcomes of Medical Care
Lectures. Two 2-hour session each week. 2.5 credits. Dr. Tarlov, Dr. John Ware. In this course each student is to acquire working expertise with health as a concept, the measurement of functional status and well-being, and the use of functional status in community health programs and in policy formulation. Each student will be given a data set from a large national research project.
Course Activities: Each student is expected to prepare a manuscript, and analyze, interpret and point up the policy relevance of the data.
Course Note: Graduate course in statistics or equivalent proficiency, course in health services, familiarity with computers required; signature of the instructor required indicating suitable background.
WF 3:30 - 5:20; Room 204, III

HPM 255c. Reimbursement Systems
Seminars. Two 2-hour sessions each week. 2.5 credits. Ms. Backer. Examines issues related to the general theme of third-party reimbursement for health care institutions. The principal focus is on hospitals. Issues include cost containment efforts, hospital perspectives, and the role of incentives. Some specific systems are examined in detail in order to assess the feasibility of certain techniques and to address questions of overall reimbursement system design.
Course Note: Introductory courses in financial and cost accounting are recommended.
TR 8:30 - 10:20; Room 206, III

HPM 256c. Evaluation of Quality of Health Care
Lectures. Two 2-hour sessions each week. 2.5 credits. Dr. Palmer. An intensive preparation in methods and strategies for evaluation of quality of health care. Through lectures, classroom exercises, teaching assistant sessions, and homework, students learn the terminology, concepts, and strategies for quality measurement. Guest speakers describe use of quality measurement in a variety of health care environments in which they work.
Course Note: Experience with delivery of personal health services is strongly desirable, as well as an understanding of basic principles of biostatistics and epidemiology.
MW 1:30 - 3:20; Room 213, III

HPM 257c. Use of Outcomes in Quality Assessment
Seminars. One 2-hour session each week. 1.25 credits. Dr. Greenfield. Addresses the applications of outcomes research to quality of care assessment and effectiveness. Focuses on the historical, conceptual, and practical basis for using outcome vis-a-vis process. Develops the basis for the routine interpretation and use of health status measures.
Course Note: Introductory course in epidemiology and statistics required; signature of the instructor required indicating suitable background.
T 3:30 - 5:20; Room 204, III

HPM 258d. Physician Performance
Seminar. Two 2-hour sessions each week. 2.5 credits. Dr. Calkins, Dr. Pearson. Examines factors influencing physician practice, including training, experience, organizational setting, financial incentives, and patient preferences. Considers strategies for changing physician behavior, such as education, feedback, guideline development, and outcomes research.
Course Note: Experience in health care delivery is an advantage, but is not required.
MW 1:30 - 3:20; Room 202, III

HPM 259d. Quality Management in Health Care
Lectures. One 2-hour session each week. 1.25 credits. Dr. Berwick, Dr. Goonan. This course introduces the concepts and tools of Total Quality Management. The techniques of Quality Management originated in the industrial sector and have been successfully applied to health care delivery. Through lectures and case studies, students learn to develop and implement Quality Management Systems. Topics include: continuous quality improvement, quality planning, measurement, design and improvement, and statistical process control.
F 1:30 - 3:20; Room 213, III

EHH 260cd. Fundamentals of Exposure and Risk Assessment (Department of Environmental Health and the Department of Health Policy and Management) (Course described under Environmental Health)

HPM 266cd. Seminar on Refugee Trauma
Lectures. One 2-hour session each week. 2.5 credits. Dr. Mollica, Dr. Anderson, Dr. Lavelle. This course focuses on the public health problems of highly traumatized refugee populations. Millions of refugees and displaced persons exist world-wide. Many are suffering from poor health, economic and cultural deprivation, on going violence, and long-term confinement. This course is a comprehensive overview of the international approach, theoretical models, and public health strategies for dealing with the refugee crisis. Innovative health and mental health problems will be presented. Video and guest lecturers will supplement the course's academic framework.
R 8:30 - 10:20; Room 203, III

HPP 268cd. Financing Health Care in Developing Nations
Lectures. Two 2-hour sessions each week. 5 credits. Dr. Hsiao, Dr. Berman. This course provides students with a wide-ranging introduction to public and private financing of health care in developing countries. Financing methods covered include community financing, social insurance, user's fees, privatization, and efficiency improvement. Analyzes economic considerations in alternative approaches to financing, including equity, efficiency, and stability. Reviews formal perspective of economic theory. Assesses link between stages of national development and health care financing.
Course Note: HPM 205ab or HPM 206ab required; signature of the instructor required.
TR 1:30 - 3:20; Room 213, III

HPM 269b. Comparative Health Systems in Industrialized Societies
To be given 1993-94; offered alternate years. Lectures. One 3-hour session each week. 2.5 credits. Dr. Field. The current debate about health care in America makes it imperative to examine other systems as already made experiments. A comparative examination of the health systems of industrial and urban societies. This course seeks to better understand shared structural features as well as critical differences. A basic framework for the comparative approach will be presented, as well as substantive materials on several health systems. A national health system is a result of the dialectic combination of (1) universal aspects of scientific and medical knowledge and techniques held to be valid everywhere, and (2) the particular aspects of each nation's social structure, political culture, history, traditions and value commitments, as well as economic resources. This course will attempt to demonstrate how essentially the same problems are approached in a variety of ways, provided the student is aware that the didactic aspect of such an exercise is limited by the particular elements mentioned above.
W 1:30 - 4:20; Room 206, III

HPM 270a. Issues in Mental Health (Cross-listed as KSG-HCP-177m)
Seminars. One 3-hour session each week. 2.5 credits. Dr. Dorwart, Dr. Chartock. This seminar will examine the historical development and current status of selected policy issues relevant to mental health services in the United States, with special attention given to the role of government. Topics will include: deinstitutionalization of mental hospitals, privatization of psychiatric services, purchase of mental health services by state government, the role of federally funded community mental health centers, and the organization of financing of state mental health agencies. In addition to lectures and guest speakers, case discussions will feature issues such as siting of community residences, judicial involvement in the rights of the mentally retarded, and state legislative reform of service delivery systems. The seminar will be designed to complement modules on implementation of human services programs for special populations, such as elderly, children or disabled.
MW 2:30 - 3:50; TBA at KSG

HPM 272s. Health Services/Policy Research
Lectures. Five 1.75-hour sessions each week for 3-1/2 weeks. 2.5 credits. Instructor to be arranged. Introduces major issues in health policy, including access, provision of insurance, and physician and hospital payment. Examines methodologies used to study these areas, including assessment of severity of illness and health status, measurement of quality, and survey techniques. Demonstrates how research techniques can be used to study policy-relevant areas.
Course Note: For Participants in the Summer Program in Clinical Effectiveness only.
TBA

HPM 274abcd. Dental Care Administration Research Seminar (Cross-listed as HDS-DCA 222)
Lectures, seminars. One 2-hour session each week. 5 credits for both semesters. Dr. Douglass. The fall term concentrates on the research methods of current national studies of the need, supply, demand, and cost of dental care. Policy documents of the ADA, IOM, OTA, Research Triangle Institute, RAND Corp., and the NCHS are studied. Research designs and data collection methods are reviewed. The spring term emphasizes the research work of faculty and students on relevant dental care policy and management subjects. Grade is based upon participation and the defense of a current research project.
Course Note: Upon completion of HPM 274 ab, 0 credits and grade of "SIP" (Still in Progress) will be assigned; upon successful comple-

tion of both HPM 274ab AND HPM 274cd, students will receive 5 credits and a final grade.
W 5:30 - 7:20 p.m. at HDS

HPM 275ab. Dental Public Health and the Dental Care Delivery System
Seminars. One 2-hour session each week. 2.5 credits. Dr. Antczak-Bouckoms. Reviews basic concepts in dental public health and the dental care delivery systems in the U.S. and other countries. Examines issues of utilization of services, need versus demand for dental care, methods of quality assurance, and the role of government agencies in the provision and regulation of dental care. The effects of alternative methods of financing dental care on utilization and provider incentives are also discussed.
M 3:30 - 5:20; Room 203, III

HPM 276cd. Technology Assessment in Dentistry
Seminars. One 2-hour session each week. 2.5 credits. Dr. Antczak-Bouckoms. Examines basic concepts in the epidemiology of oral diseases and reviews changes in disease prevalence. Discusses the measurement of oral health status into treatment needs for planning purposes. Methods of evaluating dental care are also covered, including clinical decision making, research design, quality assessment of experimental evidence, and meta-analysis.
M 1:30 - 3:20; Room 201, III

[HPM 279c.] Quantitative Policy Analysis
Not to be given 1993-94. Lectures, seminars, case studies. Three 2-hour sessions each week. 2.5 credits. Instructor to be announced. Introduces students to techniques of decision analysis, cost-effectiveness analysis, and benefit-cost analysis. Emphasizes applications in the areas of health policy, planning, and management. Readings from health, safety, and environmental literature are used to illustrate the techniques and their limitations.

HPB 280b. Decision Analysis for Health and Medical Practices (Department of Health Policy and Management and the Department of Biostatistics)
Lectures. Two 2-hour sessions each week. 2.5 credits. Dr. Paltiel. Concerns the methods and applications of decision analysis, cost-effectiveness analysis, and cost-benefit analysis in the evaluation of medical technologies and health programs. Stresses applications and limitations. Examples used to illustrate techniques include: treatment decision for acute abdominal pain, coronary artery bypass surgery, cost effectiveness of pharmaceuticals, evaluation of immunization programs, and priority setting for AIDS prevention. Course emphasizes applications to medical technology assessment and health care resource allocation.
Course Note: BIO 200ab, or BIO 201ab, or BIH 203b, (may be taken concurrently), or equivalent introductory course in probability and statistics required.
MW 3:30 - 5:20; Room 502, III

HPB 281c. Clinical Decision Analysis (Department of Health Policy and Management and the Department of Biostatistics)
Lectures, seminars. Two 2-hour sessions each week. 2.5 credits. Dr. Pliskin. An intermediate-level course on methods and applications of decision analysis and other modeling techniques to clinical problems. Topics include: Markov models, life expectancy and survival modeling, dynamic models, ROC analysis and diagnostic technology assessment, quality of life valuation, multiattribute utility, and behavioral decision theory. Class sessions include presentation of methods and critiques of published analysis of medical decision problems. Students will learn computer software for decision modeling.
Course Note: HPB 280b, HPM 286s; or signature of the instructor required. Presumes knowledge of decision analysis.
MW 3:30 - 5:20; Room 204, III

HPB 282d. Cost-Effectiveness and Cost-Benefit Analysis for Health Program Evaluation (Department of Health Policy and Management and the Department of Biostatistics)
Lectures, seminars. Two 2-hour sessions each week. 2.5 credits. Dr. Graham. Topics include: methods and applications of cost-effectiveness and cost-benefit analysis for health program evaluation, medical technology assessment, and environmental risk analysis; theoretical foundations; "shadow" pricing; economic valuation of life saving; choice of discount rates; cost accounting applied to economic evaluation in institutional settings; methods for assessing costs of environmental controls; economic evaluation of biomedical research; health status indexes; ethical issues; and modern critiques.
Course Note: HPB 280b, HPM 286s, or signature of the instructor required; HPM 205ab, HPM 206ab, or signature of the instructor required.
MW 8:30 - 10:20; Room 502, III

HPE 284c. Decision Theory (Department of Health Policy and Management and the Department of Environmental Health)
Lecture, seminars. Two 2-hour sessions each week. 2.5 credits. Dr. Paltiel, Dr. Hammitt. Introduces the axiomatic method of economic reasoning, presents the standard models of individual decision making under uncertainty, and explores methodological issues created by applications to health research. Topics include: the theory of choice and preference; traditional models of expected utility; subjective probability; Bayesian statistical decision theory; alternative models of decision making (behavioral decision theory, regret theory, prospect theory).
Course Note: Math at the level of Math 20 (GSAS), a probability course that employs calculus, at least one course in Decision Analysis required (this can include a course in the methods of Operations Research or Environmental Health); signature of the instructor required.
TR 8:30 - 10:20; Room 204, III

HPE 285b. Seminar on Risk Analysis (Department of Health Policy and Management and the Department of Environmental Health)
Seminars. Two 1.5-hour sessions each week. 2.5 credits. Dr. Tayor, Dr. Graham. Challenges students to evaluate the risk analysis framework as an approach to managing health, safety, and environmental hazards. Addresses contemporary issues in risk assessment, risk evaluation, risk management, and risk communications. Course applications are particularly appropriate for students with career interests in occupational and environmental health. This is an course aimed at students who have experience in biostatistics, epidemiology, toxicology, and health policy and management.
Course Note: Signature of the instructor required.
M 5:00 - 7:50 p.m.; Room 209, III

HPM 286s. Decision Analysis in Clinical Research
Lectures. Five 1.75-hour sessions each week for 3.5 weeks. 2.5 credits. Dr. Weinstein. Introduces the following topics: decision analysis methods relevant to clinical decision making and clinical research; probability theory and the use of probability to express uncertainty; utility theory and its use to express patient preferences for health outcomes; diagnostic test use and evaluation; and uses and limits of decision analysis in clinical decision making and research design.
Course Note: For participants in the Summer Program in Clinical Effectiveness only.
TBA

HPM287 abcd. Research Seminar on Risk and Decision Analysis
Seminars. One 2-hour session every two weeks. 2.5 credits. Dr. Paltiel, Dr. Graham. This doctoral level seminar introduces students to state-of-the-art scholarship in risk analysis and decision theory. Bi-weekly guest speakers from both within and outside the univeristy will present their current research projects. The seminar will aim for balance between theoretical and applied projects. While specific topics will change from year to year, relevant fields will include: theory and techniques of risk analysis; choice under uncertainty; health policy models; cost-effectiveness analysis; statistical decision theory; subjective probability and utility assessment.
Course Note: Student involvement in discussions will be encouraged.
"ab" period
T 12:30 - 2:00; Room 202, III
"cd" period
TBA

HPM 290ab, cd. Applied Research and Practice in Health Policy and Management
Seminars. One 2-hour session each month. Field work. One day each week. 5 credits each semester. Dr. Hemenway. Teaches students to apply analytic and managerial methods to concrete problems. Each student carries out a research project, conducts a policy analysis, or performs a management study on behalf of an individual or institutional sponsor. Students work with course faculty and sponsors to develop project proposals. Students meet individually and in small groups with faculty advisors to discuss project methods. At the conclusion of the course, students prepare oral and written reports summarizing their findings. Course Note: Acceptance into the two-year Master of Science program in Health Policy and Management or signature of the instructor required; must register in appropriate semester.
TBA

HPM 291cd. Applied Research in the Law of Health Policy and Management
Field studies. 2.5 credits. Dr. Brennan, Mr. Green. Allows students in the Law and Public Health Concentration of the MPH degree program to apply analytic skills to a practical problem. Students carry out a research project, perform a policy analysis or conduct a managerial study on behalf of an individual or institutional sponsor.
Course Note: Signature of the instructor required.
TBA

HPM 294b. Methodology Issues in Health Services Research
Lectures. Two 2-hour sessions each week. 2.5 credits. Dr. Kaplan. This course is designed for students intending to pursue health services research. Emphasizes the array of methods available to researchers, their disciplinary origins, underlying assumptions, and strengths and weaknesses. For each topic, readings include an overview of the method, drawn largely from research methods texts, and specific examples from the literature.
Course Note: Signature of the instructor required.
MW 1:30 - 3:20; Room 209, III

HPM 296cd. Doctoral Seminar in Health Economics (Cross-listed as KSG-HCP 281 and FAS-EC 2910)
Seminars. One 2-hour session each week. 2.5 credits. Dr. Hsaio. Explores frontier work in the field of health economics. Focuses on learning advanced theories and economic models useful for policy analysis, and on helping students develop dissertation and/or research topics. Students enrolled for credit are expected to present original research at the end of the semester.
Course Note: Doctoral candidates or very advanced Master's students (with the signature of the instructor); a graduate-level microeconomics course is required; signature of instructor required indicating suitable background.
W 4:00 - 5:50 p.m.; Room 209, III

HPM 300 a,b,c,d,s. Tutorials
Time and credit to be arranged. Members of the Department. An opportunity for tutorial work is offered for interested and qualified students or small groups of students. Arrangements must be made with individual faculty members and are limited by the amount of faculty time available. These programs are open to all students who wish to go beyond the content of the regular courses.
Course Note: Completed tutorial contract is required at the time of registration; maximum of 5 credits per tutorial topic; pass/fail only; course enrollment requires the signature of the instructor.
TBA

HPM 330e, 330f. Field Work
Time and credit to be arranged. Students are assigned to work on special projects such as group surveys, field projects, or observation of, and limited participation in, the work of health agencies. Field assignments are made on an individual basis to meet the needs of each student insofar as possible. Work in the field is coordinated with courses in the department.
Course Note: Signature of the instructor required.
TBA

HPM 350 a,b,c,d,s. Research
Time and credit to be arranged. Members of the Department. For doctoral candidates who have passed their school-wide Oral Qualifying Examination and who are undertaking advanced work along the lines of fundamental or applied research in the department.
Course Note: Pass/Fail only; maximum of 20 credits; course enrollment requires the signature of the instructor.
TBA

Health and Social Behavior

HSB 200a. Social and Behavioral Dimensions of Public Health
Lectures, seminars, case studies. Two 1.5-hour sessions each week. 2.5 credits. Dr. Rudd, Members of the Department. Introduces important behavioral science concepts and insights useful in the design, implementation, and/or evaluation of change strategies to advance health. Introduction to major theoretical and conceptual frameworks from sociology and social psychology and their application to a range of contemporary public health problems.
Course Activities: Short written reflections (1-3 pages) on assigned readings, on synthesis paper (5-8 pages), class instructions.
Course Note: Departmental requirement in the Department of Health and Social Behavior; signature of the instructor required for non-HSB students.
MW 3:30 - 5:20; Room 502, III

HSB 201b. Society and Health
Lectures, seminars, case studies. One 3-hour sessions each week. 2.5 credits. Dr. Levine. Analyzes major social variables that affect population health: poverty, social class, gender, race, family, community, work, behavioral risks, and coping resources. Examines health consequences of social and economic policies, and the potential role of specific social interventions. Reviews empirical and theoretical

literature on mechanisms and processes that mediate between social factors and their health effects, and discusses alternative models for advancing public health.
Course Activities: Short written reflections on assigned readings, class discussion, final term paper.
Course Note: Departmental requirement in the Department of Health and Social Behavior; adequate writing skills are essential for this course.
W 3:30 - 6:20; Room 204, III

HSB 202a. Innovative Strategies in Health Education
Seminars. Two 2-hour sessions each week. 2.5 credits. Dr. Rudd. Highlights issues of control, participation, and empowerment with a focus on theory, design, and evaluation. The course focus is on the development of theory-based health education strategies for change.
Course Activities: Assigned readings, participation in class discussion, three essays.
Course Note: Course enrollment is limited to 25 students; signature of the instructor required.
MW 1:30 - 3:20; Room 502, III

HSB 203c. Social Origins/Control of Heart Disease
Lectures. Two 1.5-hour sessions each week. 2.5 credits. Dr. Kawachi. Analyzes the major social variables (social class, work, social networks, gender, race) that have influenced the rise and fall of the 20th century epidemic of cardiovascular disease. Uses epidemiological and sociological concepts to develop a new framework for preventive policy that takes into account the significance and inter-relationships among social factors, biological risk factors, medical management, and cardiovascular disease.
Course Activities: Class participation and seminars, six short research papers (1-3 pages), one long paper (10-15 pages).
Course Note: HSB 201b required; some knowledge of cardiovascular epidemiology (e.g., EPI 212a) suggested.
MW 10:30 - 12:20; Room 212, III

HSB 204b. Communication in Health Care Settings
Seminars. One 2-hour session each week. 1.25 credits. Dr. Daltroy. This course will focus on theory and practice of health education in the clinical encounter: doctor-patient communication, patient education, adherence to medical regimen, cognition and behavioral skills in chronic disease co-management, informed consent, and psychoeducational preparation for surgery.
Course Activities: Brief papers on readings, class discussions, one presentation.
Course Note: Clinician or social sciences backround recommended; course enrollment is limited to 18 students; signature of the instructor required.
F 10:30 - 12:20; Room 203, III

HSB 205b. Teaching and Working with Groups
Seminar. One 3-hour session each week. 2.5 credits. Dr. Rudd. This experiential seminar on group work is based on role play and reflective analysis. Participants will develop listening skills, experiment with activities that build group cohesion and trust, and focus on group maintenance as well as task oriented roles. Role play (many drawn from training exercises) with follow-up analysis will form the basis of most class work. Class discussion will be supported by a reading packet.
Course Activities: Readings, participation in class activities and discussions, weekly reflection papers.
Course Note: Course enrollment is limited to 18 students; signature of the instructor required.
T 10:30 - 1:20; Room 203, III

HSB 206d. HIV, Transmission, and Social Behavior
Lectures. Two 2-hour sessions each week. 2.5 credits. Dr. Gortmaker. Examines and analyzes behavior in light of the HIV epidemic in the United States. Covers stigma, taboo, identity, sexual and drug using behaviors and the social construction and production of behavior. Both proximal (such as needle-sharing) and distal (such as a history of sexual abuse) behavioral risks for HIV transmission will be considered. Using reading, discussion, interactive small group activities, and guest lecturers, students will build knowledge of the behavioral and social basis of HIV transmission.
Course Note: Course enrollment is limited to 20 students; signature of the instructor required.
TR 3:30 - 5:20; Room 204, III

[HSB 208d.] Public Health Practice for Social Change
Not to be given 1993-94. Lectures. One 2-hour session and one 1.5-hour session weekly. 2.5 credits. Dr. Avery, Dr. Rudd. The course is built around dialogues with innovative community leaders to explore a variety of approaches used in front-line public health practice. Emphasis is on the experience of activists from diverse ethnic and racial backgrounds working at the grassroots and lower income levels, and on the challenges to effective and responsible public health practice posed by basic social and economic inequalities.
Course activities: Group discussion, written and oral group projects, individual class presentations.
Course Note: One previous HSB course required.

MCS 210ab. An Introduction to Personality and Cognitive Development (Department of Maternal of Child Health and the Department of Health and Social Behavior) (Course described under Maternal and Child Health)

HSB 210c. Principles for Designing Health Interventions.
Lectures, seminars. Two 2-hour sessions each week. 2.5 credits. Dr. Rudd, Dr. Daltroy. Introduces program planning models for health interventions. The course focuses on the planning process and includes an examination of individual, institutional, and community related actions and decisions for healthful change.
Course Activities: Assigned readings, participation in class discussion, one brief essay, group-developed program plan.
Course Note: One course in the Department of Health and Social Behavior required; suggested background reading packet available; course enrollment is limited to 25 students; signature of the instructor required.
TR 1:30 - 3:20; Room 203, III

HSB 211b. Health Promotion through the Mass Media
Lectures, consultations. One 2-hour session each week plus one 1/2-hour consultation with student work groups. 2.5 credits. Dr. DeJong. Covers the development of public communication campaigns in the field of health promotion: assessing what the mass media can accomplish to promote health; designing educational materials that are consonant with principles of behavioral science; conducting formative research; and executing an integrated mass media campaign.
Course Note: Preference is given to students in Health and Social Behavior; course enrollment is limited to 20 students; signature of the instructor required.
F 1:30 - 3:50; Room 209, III

HSB 212cd. Developing Radio Communications

Lectures. One 2-hour session each week. 2.5 credits. Dr. DeJong, Mr. Schwartz. Covers the development and use of radio communications in public health. Participants create an original radio commercial, moving from background research to scripting and final production.
Course Activities: Two trips to a New York studio; teleconferences with Mr. Schwartz in New York.
Course Note: Preference is given to students in Health and Social Behavior; course enrollment is limited to 15 students; signature of the instructor required.
F 3:30 - 5:20; Room 203, III

[HSB 214b.] Behavior and Lifestyle Intervention

Not to be given 1993-94; offered alternate years. Seminars. One 3-hour session each week. 2.5 credits. Dr. Benfari. The course is based on the Adult Model of learning. Focuses on the role of the interventionist in the therapeutic alliance. Topics include self analysis, the role of motivation, problem solving styles, conflict resolution, power and influence in designing and implementing programs. Selected cognitive behavioral techniques are discussed and developed.
Course Activities: Readings, group discussions, cases, self-assessment, films.

HSB 217cd. Disaster Management

Lectures. One 2-hour session each week. 2.5 credits. Dr. Pierce, Dr. Leaning. Designed for physicians or public health officers who may be charged with responsibility for on-the-scene, immediate acute intervention during disasters. The focus will be on decision-making under stress, examining U.S. and international case studies within the theoretical framework of disaster planning, response, and assessment.
Course Activities: Students will be asked to present a protocol addressing a specific disaster from the viewpoint of a public health official.
R 8:30 - 10:20; Room 202, III

HSB 218cd. Organizational and Community Approaches to Health Promotion

Lectures. One 2-hour session each week. 2.5 credits. Dr. Sorensen. Examines health promotion/education intervention with a focus on organizations,worksites and communities. Applies basic social science principles with emphasis on both individual and organizational approaches to health promotion and health behavior change.
Course Note: Course enrollment is limited to 25 students; signature of the instructor required.
W 3:30 - 5:20; Room G-2, III

HSB 220cd. An Introduction to High-Risk Behaviors: Epidemiology, Prevention, and Public Policy

Seminars. Two 1.5-hour sessions each week. 5 credits. Dr. Wechsler. Examines high-risk behaviors that place an individual at higher risk for developing health problems. Focuses on epidemiology, prevention, and public policy approaches to smoking, alcohol abuse, drug abuse, gambling, inactivity, lack of proper nutrition, violence, accidental injury, unsafe driving, and unsafe sex.
Course Activities: Term paper, class presentation.
Course Note: Course enrollment is limited to 25 students; signature of the instructor required.
MW 2:00 - 3:20; Room 204, III

HSB 222c. Alcohol Abuse and Alcoholism from a Public Health Perspective

Seminars. Two 1.5-hour sessions each week. 2.5 credits. Dr. Wechsler. Covers the nature and scope of alcoholism and alcohol abuse as a public health problem; patterns of use and abuse in the general population and among special groups; diagnosis and medical complications; treatment; alcohol and the courts, the workplace, and the family; alcohol problems in primary medical care; drinking and driving; and social supports of drinking; prevention and public policy.
Course Activities: Term paper.
MW 12:30 - 1:50; Room 204, III

HSB 224a. Cancer Prevention

Lectures, case studies, laboratories. Two 2-hour sessions each week. 2.5 credits. Dr. Colditz, Dr. Sorensen, Dr. Li. This course introduces cancer prevention and control from a broad range of disciplines contributing to this multi-disciplinary area. Epidemiology and biology of cancer, approaches to prevention through behavior change (diet, smoking cessation, etc.), and models of behavior change will be covered. Participants will gain an overview of approaches to cancer prevention through additional review of ongoing prevention studies.
Course Note: Requirement for students in the Cancer Education Program; lab or section time to be announced at first meeting; course enrollment is limited to 25 students; signature of the instructor required.
TR 3:30 - 5:20; Room 203, III

HSB 230cd. Social and Behavioral Research Methods

Seminars. Two 1.5-hour sessions each week. 5 credits. Dr. Gortmaker. Covers aspects of social and behavioral research methods, including research design, measurement, sampling, data collection, and data analysis. By case studies, methodological readings, and discussion, students learn the conduct and critical evaluation of experiments, surveys, measurement construction, longitudinal research, observational studies, the use of structural equation models, and grant proposal writing.
Course Note: BIO 200ab or BIO 201ab required; a multivariate statistics course is strongly recommended.
TR 10:30 - 12:20; Room 206, III

HSB 249b. Approaches to International Tobacco Control

Lectures, seminars. Two 2-hour session each week. 2.5 credits. Dr. Kawachi. Prepares students to apply training in epidemiology, statistics, management and policy for development of comprehensive public health programs to curb tobacco use. Concepts and techniques for measuring smoking prevalence, attributable mortality and economic costs are taught. Tobacco industry global structure, marketing, political strategies and world expansion are discussed. Guest speakers describe health policy and program interventions including taxation, marketing restrictions, protection of non-smokers, public education, litigation and cessation programs.
MW 1:30 - 3:20; Room 203, III

HSB 270cd. Doctoral Seminar on Health and Social Behavior

Seminars. One 1-hour session each week. 1.25 credits. Dr. Gortmaker. Outlines the major questions pursued by contemporary researchers in the field with a focus upon underlying theoretical frameworks.
Course Activities: Doctoral student participants lead seminars, discussing their research ideas and plans, including their theoretical perspective.

Course Note: Must be a doctoral student in Health and Social Behavior or the signature of the instructor is required indicating suitable background.
R 12:30 - 1:20; Room 206, III

HSB 300 a,b,c,d,e,s. Tutorial Programs
Time and credit to be arranged. Members of the Department. An opportunity for tutorial work is offered for interested and qualified students or small groups of students. Arrangements must be made with individual faculty members and are limited by the amount of faculty time available. These programs are open to all students who wish to go beyond the content of the regular courses.
Course Note: Completed tutorial contract is required at the time of registration; maximum of 5 credits per tutorial topic; pass/fail only; course enrollment requires the signature of the instructor.
TBA

HSB 350 a,b,c,d,e,s. Research
Time and credit to be arranged. Members of the Department. For doctoral candidates who have passed their school-wide Oral Qualifying Examination and who are undertaking advanced work along the lines of fundamental or applied research in the department.
Course Note: Pass/fail only; maximum of 20 credits; course enrollment requires the signature of the instructor.
TBA

Maternal and Child Health

MCH 200a. Physical Growth and Development I
Lectures, seminars, self-instructional material. Two 2-hour sessions each week. 2.5 credits. Dr. Valadian. Instruction in physical growth, development, maturation, and aging is presented in programmed, self-instructional material, and biweekly lectures. Emphasizes the growth of children in a population as an indicator of the general health and socioeconomic development of the population. Covers topics necessary for the advanced study of growth and maturation. Also provides an understanding of assets and needs which constitute a basis for health services.
Course Activities: Seminar participation.
Course Note: Knowledge of biology or willingness to do guided readings in addition to course's required reading.
MW 1:30 - 3:20; Room 212, III

MCH 202c. Physical Growth and Development II: Seminar on Factors Affecting Growth and Development
Lectures, seminars. One 2-hour session each week. 1.25 credits. Dr. Dwyer, Dr. Farrell. This seminar explores the basic factors that operate to influence physical growth and development from conception to maturity, and their implications at the individual, family, community and national levels. The first half of the course consists of lectures on core topics and some case studies by faculty involving ongoing projects. The emphasis in the later part of the course is on faculty and student papers and presentations of topics of current interest, with specific attention to planning and providing health services, and on current and future research.
Course Activities: Lectures, case studies, student presentations and discussion.
Course Note: Previous MCH courses helpful, but not required.
F 1:30 - 3:20; Room 212, III

MCH 204ab. Maternal and Child Health Programs and Policies
Lectures, seminars, case studies. Two 2-hour sessions each week. 5 credits. Dr. Gardner. Components of health care programs for mothers and children are discussed in the context of growth and maturational processes, historical and legislative background, and social, mental health, and educational policies. Health programs appropriate to perinatal, early and late childhood, adolescence, and youth are presented in terms of the multidisciplinary and interdisciplinary action required to improve the health status of populations. Includes discussion of factors which shape current and future maternal and child health policies. Topics include infant mortality and low birthweight, maternal health and mortality, services for children with special health care needs, school health, child abuse, intentional and unintentional injury, and AIDS.
Course Activities: Group class presentations, cases and class discussion, written memoranda.
MW 10:30 - 12:20; Room 201, III

MCH 206a. Maternal and Child Health in Developing Countries
Lectures, seminars, case studies. Two 2-hour sessions each week. 2.5 credits. Dr. Valadian, Dr. Farrell. Evaluates the core elements of MCH status and services in selected developing countries, and analyzes factors which shape MCH programs in rapidly changing social environments, particularly those related to women and children's health, nutrition and poverty. Principles of continuous quality improvement are applied to case studies in planning, implementing, financing, and evaluating programs.
Course Activities: Presentations, debates, case studies, group critique, role play and presentations.
Course Note: Background in Growth and Development required; course enrollment is limited to 20 students; signature of the instructor required indicating suitable background.
MW 3:30 - 5:20; Room 201, III

MCN 207ab. Nutrition in Child Growth and Development (Department of Maternal and Child Health and the Department of Nutrition)
Lectures, Case studies. One 2-hour session each week. 2.5 credits. Dr. Dwyer. Examines principles and practical problems encountered in developing policies and programs involving nutritional issues, growth and development. Lectures on general principles or elements of nutrition provide background setting for policy and are designed to help students base their judgments on scientific evidence. Discussions involve case studies of recent relevant policy issues in industrialized and developing countries. Student papers, presentations and discussions focus on either policy or scientific issues of importance.
Course Activities: Lectures, video presentationse, case studies, and discussion, student presentations.
Course Note: Experience in human service helpful; educational or governmental experience, or course work dealing with MCH-related issues required; course in human nutrition helpful, but not required.
T 3:30 - 5:20; Room 206, III

MCH 209c. Services for Children with Disabilities
Lectures, seminars. Two 2-hour sessions each week. 2.5 credits. Dr. Crocker, Dr. Helm. Presents a consideration of selected modern service programs in the field of disabilities, including background, special features, and evaluation. Uses outside guests from community programs for many sessions.
Course Activities: Each student carries out a site visit to an active program and reports on management issues.
Course Note: The interest in children with special needs helpful; course enrollment is limited to 20 students; signature of the instructor required.
MW 10:30 - 12:20; Room 203, III

MCS 210ab. An Introduction to Personality and Cognitive Development (Department of Maternal and Child Health and the Department of Health and Social Behavior)
Lectures. One 2-hour session each week. 2.5 credits. Dr. Earls, Dr. Buka. The basic principles of child growth and development in the cognitive and the psychosocial domains are examined in this introductory course. Special emphasis is placed on understanding the theories and research of Piaget, Freud, Erikson, and others, as well as the implications of these contributions to the planning and implementation of health and/or related social and educational services for children and youth.
Course Activities: Lectures, class discussion.
F 10:30 - 12:20; Room 204, III

MCH 211cd. Women, Health, and Development
Seminars. One 2-hour session each week. 2.5 credits. Dr. Gardner, Ms. Swenson. Addresses the major issues regarding women and their relationship to health worldwide, including the changing role of women in contemporary society. Health problems are addressed in terms of their epidemiology and the impact of technology on their detection and treatment. Issues are viewed from biological, medical, behavioral, cultural, and legal perspectives.
Course Activities: Case presentations and class discussions, written and oral testimonies.
Course Note: Course enrollment is limited to 15 students; signature of the instructor required.
M 3:30 - 5:20; Room 202, III

MCH 213d. Obstetric Epidemiology
Seminars. One 2-hour session each week. 1.25 credits. Dr. Sachs, Dr. Richardson, Dr. Lieberman. Tackles controversial issues in maternal health through techniques in epidemiology applied to obstetrics. Focuses on maternal mortality, obstetric and gynecologic morbidity, evaluation of obstetric health care, and populations at risk, such as pregnancies in women over 35. Examines the epidemiology of prenatal care and prematurity, and current issues such as infant mortality, technological evaluation, newborn intensive care, AIDS, and Caesarian section.
R 1:30 - 3:20, Room 201, III

MCP 215cd. Planning and Evaluating Public Health Programs (Department of Maternal and Child Health and the Department of Health Policy and Management)
Lectures, seminars, case studies. One 2-hour session each week. 2.5 credits. Dr. Gardner. Considers the organization and administration of national, state, and local public health programs. Focuses on the development of knowledge and skills in policy formulation, needs assessment, planning, implementation, and evaluation of public health programs in the U.S.
Course Activities: Class discussion, development of a complete written program proposal, oral presentation of proposal for critical review.
T 1:30 - 3:20; Room 201, III

MCN 217d. Nutritional Surveillance (Department of Maternal and Child Health and the Department of Nutrition)
Seminars, case studies. Two 2-hour sessions each week. 2.5 credits. Dr. Peterson. Theoretical and practical issues guiding the design and implementation of domestic and international nutritional surveillance systems will be covered, including purposes for data collected, indicators of nutritional status for high risk groups, methodological issues affecting the choice of indicators and interpretation of nutritional surveillance data. Students will develop competence in the application of nutritional surveillance data through case studies and the design of a nutritional surveillance system tailored to a community of the student's choosing.
Course Activities: Class discussion, oral group presentations, written paper.
Course Note: MCH 200a, NUT 210cd, or MCN 207ab recommended; introductory biostatistics and epidemiology courses required or signature of the instructor.
TR 8:30 - 10:20; Room 204, III

MCH 218d. The Urban Child in Global Perspective
Seminar. Two 2-hour sessions each week. 2.5 credits. Dr. Earls, Dr. Carlson. The global and national patterns of urbanization and risk factors for physical and psychological morbidity will be examined. These risk factors include changing family structure, homelessness, poverty and labor force participation and exposure to infectious diseases. Experienced field workers, documentation on video and film, UNICEF materials on "children in especially difficult circumstances" and other case reports will be included in the syllabus.
Course Activities: Critical review of documentary film material, site visit to shelter for homeless families, preparation of brief report on a relevant topic.
Course Note: An interest in children recommended; course enrollment is limited to 20 students; signature of the instructor required.
TR 3:30 - 5:20; Room 206, III

MCH 219d. Research Methods in Maternal and Child Health
Seminars. One 2-hour session each week. 1.25 credits. Dr. McCormick. This course is designed to provide an overview of research methods appropriate to maternal and child health through lectures and seminars. Topics will include use of vital statistics, confidential perinatal inquiry, admission severity scores, child health status measures, and methods of ascertaining rare populations.
Course Activities: Presentation, discussion, written report.
Course Note: Course enrollment is limited to 20 students; signature of the instructor required.
F 10:30 - 12:20; Room 206, III

MCH 222b. Social Services for Children, Adolescents and Families
Lectures, seminars. Two 2-hour sessions each week. 2.5 credits. Dr. Newburger, Dr. Cole. Presents the crucial role of social services in maintaining and promoting the health of children and their families. Beginning with a historical overview of social services in the U.S., the course examines current political trends which structure the content and delivery of social services, drawing comparisons with those in other countries. The social and psychological determinants of the need for social services focus on events of public health relevance, including terminal illness in childhood, adoption/foster care, family violence, day care, and services for children with HIV infection.
Course Activities: Seminar discussion based on current policy, case discussions.
Course Note: Interest in social services/policy recommended.
TR 1:30 - 3:20; Room 209, III

MCE 223b. Childhood Mental Disorders: Public Health Perspectives (Department of Maternal and Child Health and the Department of Epidemiology)
Lectures, seminars. Two 2-hour sessions each week. 2.5 credits. Dr. Deykin. Examines the occurrence and known risk factors of selected mental disorders of childhood and adolescence, including drug abuse, depression, hyperactivity, and anorexia. Emphasizes the methodological issues of case definition, disorder classification, current diagnostic and screening instruments, and the advantages/disadvantages of available data sources. Readings include studies selected to illustrate methodological options and usefulness for public health

research. Students are required to develop and present a research design on a childhood mental disorder of their choice.
Course Activities: Classroom discussions focused on critical review of relevant published material, presentation of research design.
Course Note: Interest in research in mental disorders of children; some clinical experience helpful, but not necessary; Epidemiology 201 or an equivalent course taken at HSPH or elsewhere required; course enrollment is limited to 12 students; signature of the instructor required.
MW 1:30 - 3:20; Room 212, III

HPC 242b. Strategies for Change in Health (Department of Health Policy and Management and the Department of Maternal and Child Health) (Course described under Health Policy and Management)

HPC 251d. Violence Prevention: Issues and Controversies (Department of Health Policy and Management and the Department of Maternal and Child Health) (Course described under Health Policy and Management)

MCH 300 a,b,c,d,s. Tutorials
Time and credit to be arranged. Members of the Department. An opportunity for tutorial work is offered for interested and qualified students or small groups of students. Arrangements must be made with individual faculty members and are limited by the amount of faculty time available. These programs are open to all students who wish to go beyond the content of the regular courses. Tutorial work may include participation in departmental research, specialized readings, field projects in a local or state health agency, or small studies to examine more in-depth topics introduced in various courses such as planning and evaluation of MCH services for children with handicapping conditions.
Course Note: Completed tutorial contract is required at the time of registration; maximum of 5 credits per tutorial topic; pass/fail only; course enrollment requires the signature of the instructor.
TBA

MCH 330f. Field Study
Field study is arranged on an individual basis to meet the special needs of each student insofar as possible.
Course Note: Pass/fail only; course enrollment limited; course enrollment requires the signature of the instructor required.
TBA

MCH 350 a,b,c,d,s. Research
Time and credit to be arranged. Members of the Department. For doctoral candidates who have passed their school-wide Oral Qualifying Examination and who are undertaking advanced work along the lines of fundamental or applied research in the department.
Course Note: Pass/Fail only; maximum of 20 credits; course enrollment requires the signature of the instructor.
TBA

Molecular and Cellular Toxicology

TOE 204ab. Principles of Toxicology (Department of Molecular and Cellular Toxicology and the Department of Environmental Health) (Cross-listed as HMS-BP 713.0 and FAS-BCMP 218)
Lectures, seminars. Two 2-hour sessions each week. One 2-hour (optional) discussion session each week. 5 credits. Dr. Schiestl, Dr. Milton. Emphasizes mechanisms of injury and clinical consequences following exposures to environmental and occupational chemicals. Actions are examined at the molecular, cellular, organ system, and organismal levels. Modern methods for detecting, evaluating, analyzing, and combating the toxic effects of environmental and industrial chemicals are discussed, as are perspectives on the scientific basis for risk estimation in humans.
Course Activities: Written examinations.
Course Note: Organic chemistry and mammalian physiology or equivalents required; lab or section time to be announced at first meeting.
TR 10:30 - 12:20; Room 213, III

TOX 208ab. Seminar in Toxicology
Seminars. One 1-hour session each week. 1 credit. Dr. Schlegel, Members of the Department. Includes seminars, journal clubs, and discussions of topics in basic research and the current literature in toxicology.
Course Activities: Participation in discussions.
Course Note: Background in toxicology or related fields; pass/fail only; signature of the instructor required.
W 9:00 - 10:00; Room 213, III

TOX 209cd. Seminar in Toxicology
Seminars. One 1-hour session each week. 1 credit. Dr. Schlegel, Members of the Department. Includes seminars, journal clubs, and discussions of topics in basic research and the current literature in toxicology.
Course Activities: Participation in discussions.
Course Note: Background in toxicology or related fields; pass/fail only; signature of the instructor required.
W 9:00 - 10:00; Room 213, III

TOX 210ab. Advanced Toxicology
Seminars, laboratories. Number of class sections and length of each class session TBA. 5 credits. Dr. Tashjian, Members of the Department. Examines experimental methods of research in toxicology. Includes individual laboratory work.
Course Activities: Laboratory work arranged with supervisor.
Course Note: TOE 204ab or equivalent required; pass/fail only; signature of the instructor required.
TBA

TOX 211cd. Advanced Toxicology
Seminars, laboratories. Number of class sections and length of each class session TBA. 5 credits. Dr. Tashjian, Members of the Department. Examines experimental methods of research in toxicology. Includes individual laboratory work.
Course Activities: Laboratory work arranged with supervisor.
Course Note: TOE 204ab or equivalent required; pass/fail only; signature of the instructor required.
TBA

TOX 212cd. Molecular and Cellular Endocrinology (Cross-listed as HMS-BP 708.0, FAS-BCMP 212)
To be given 1993-94; offered alternate years. Lectures, seminars. Two 2-hour sessions each week. 5 credits. Dr. Tashjian. Examines current knowledge and experimental approaches to understanding the biosynthesis and secretion of peptide and steroid hormones, and the biochemical and molecular mechanisms by which hormones act on target cells to regulate differentiated functions. Topics covered include structure and regulation of protein hormone genes; hormone receptor structure and transduction mechanisms; cyclic AMP and phosphoinositides as intracellular messengers; control of cellular calcium; hormonal regulation of specific gene expression; and the functions of protein kinases and phosphatases. Detailed examples

will be chosen principally from two areas: 1) control of pituitary gland function by hypothalamic neuropeptides and actions of pituitary hormones on their target glands; and 2) hormonal control of mineral and calcium metabolism.
Course Activities: Verbal presentations, class discussion, written examinations.
Course Note: General biochemistry and mammalian physiology or equivalents required; signature of the instructor required.
TR 1:30 - 3:20; Room 204, III

TOX 250cd. Molecular and Cellular Toxicology (Cross-listed as HMS-BP 723.0 and FAS-BCMP 217)
To be given 1993-94; offered alternate years. Lectures, seminars. Dr. Demple. Two 2-hour sessions each week. 5 credits. Examines key issues and approaches in modern toxicology, focussed on emerging research at the molecular and cellular levels. Specific topics will include genetic toxicology (DNA repair, aberrant recombination, genetic instability, effect of carcinogens on gene expression, etc.), pathology of the cell cycle, carcinogenesis (tumor promotion, molecular biology of tumor suppressors), molecular epidemiology, and risk analysis. Weekly lectures and related critical discussions of selected current research papers.
Course Activities: Participation in discussions, oral and written projects.
Course Note: Background courses in biochemistry, cell biology, and genetics required; signature of the instructor required indicating suitable background; course enrollment is limited to 20 students.
MW 1:30 - 3:20; Room 212, III

TOX 300 a,b,c,d,s. Tutorial Programs
Time and credit to be arranged. Members of the Department. An opportunity for tutorial work is offered for interested and qualified students or small groups of students. Arrangements must be made with individual faculty members and are limited by the amount of faculty time available. These programs are open to all students who wish to go beyond the content of the regular courses. Opportunities are provided for tutorial work in molecular, cellular, biochemical, and environmental toxicology.
Course Note: Completed tutorial contract is required at the time of registration; maximum of 5 credits per tutorial topic; pass/fail only; course enrollment requires the signature of the instructor.
TBA

TOX 350 a,b,c,d,s. Research
Time and credit to be arranged. Dr. Tashjian, Dr. Call, Dr. Demple, Dr. Frei, Dr. Ofner, Dr. Samson, Dr. Schiestl, and Dr. Schlegel. Time and credit to be arranged. Members of the Department. For doctoral candidates who have passed their school-wide Oral Qualifying Examination and who are undertaking advanced work along the lines of fundamental or applied research in the department.
Course Note: Pass/Fail only; maximum of 20 credits; course enrollment requires the signature of the instructor.
TBA

Nutrition

NUT 201b. Principles of Nutrition
Lectures. Two 2-hour sessions each week. 2.5 credits. Dr. Lo, Members of the Department. Emphasizes basic concepts of nutrition, including relationships between nutrition and problems such as cancer and heart disease.
TR 1:30 - 3:20; Room G-2, III

NUT 202cd. The Science of Human Nutrition
Lectures. Two 2-hour sessions each week. 5 credits. Dr. Herera, Dr. Frei. This course reviews the biochemistry of carbohydrates, fats, proteins, vitamins, and minerals in the context of human disease. Particular emphasis is given to current knowledge of the mechanisms that may explain the role of diet in the causation and/or prevention of ischemic heart disease, diabetes, obesity, hypertension, and cancer. Recommended dietary intakes of selected nutrients will be discussed in order to understand their limitations. Course Note: NUT 201b is strongly recommended; prior familiarity with nutrition and the health sciences is expected, as is a basic knowledge of biochemistry and human physiology.
TR 1:30 - 3:20; Room 502, III

NUT 203ab, cd. Departmental Seminars in Nutritional Biochemistry
Seminars. Two 1-hour sessions each week. 2.5 credits each semester. Dr. Sul, Members of the Department. Students participate in and present seminars reviewing current research and publications related to nutrition in addition to attending advanced seminars presented by faculty and guest speakers. Beginning students learn skills required for oral presentations. Topics include both basic research and applied areas of nutrition.
Course Note: HSPH degree candidates only; signature of the instructor required.
"ab" period
T 12:30 - 1:20; Room 209, III
T 4:00 - 5:00; Room 209, III
"cd" period
F 12:30 - 1:20; Room 214b, II
F 4:00 - 5:00; Room 214b, II

NUT 204cd. Departmental Seminars
Seminars. Two 1-hour sessions each week. 2.5 credits each semester. Dr. P. Goldman, Members of the Department. Students have an opportunity to review and analyze recent key papers that provide either epidemiological or laboratory evidence that bears on a topic of current interest in human nutrition. Additionally, students learn skills necessary for oral presentation.
Course Note: HSPH degree candidates only; signature of the instructor required.
T 12:30 - 1:20; Room 317, II
T 4:00 - 5:00; Room 214b, II

MCN 207cd. Nutrition in Child Growth and Development (Department of Maternal and Child Health and the Department of Nutrition) (Course described under Maternal and Child Health)

NUT 209ab. Food Science and Nutrition
Lectures. One 2-hour session each week. 2.5 credits. Mrs. Witschi. Deals with nutrition in terms of the foods which supply mankind's nutrient needs, their composition and physical properties, and the positive and negative effects of genetic manipulation on nutrient qualities of food, agricultural practice, processing, storage, and cooking. The historical development of food technology, including methods of preservation and sanitation, is related to current methods employed in both developing and industrialized countries.
W 1:30 - 3:20; Room 317, II

NUT 210cd. Nutritional Problems of Less-Developed Countries
Lectures. One 2-hour session each week. 2.5 credits. Dr. Herrera-Acena. The nutrition problems of less-developed countries are discussed in the context of basic human needs. The ecology and the biological and behavioral consequences of malnutrition are reviewed in detail. Special emphasis is on issues in human biology relevant to

the formulation of nutrition policy and programs.
W 3:30 - 5:20; Room 203, III

NUT 214ab, cd. Research Techniques in Nutritional Biochemistry
Laboratory. Fifteen hours minimum each week. 5 credits each semester. Dr. Wessling-Resnick, Members of the Program in Nutritional Biochemistry. Students rotate through the laboratories (one each period) of faculty members in the Nutritional Biochemistry Program in order to learn current techniques applied to nutritional, cellular, and biochemical research. Students present oral and written reports on the research they have completed to the Nutrition faculty one rotation per quarter.
Course Note: Generally limited to Nutritional Biochemistry students in the Department of Nutrition; must register for course in appropriate semesters.
"ab" period
W 12:30 - 1:20; Room 317, II
"cd" period
TBA

NUE 216cd. Nutritional Epidemiology (Department of Nutrition and the Department of Epidemiology)
Lectures. One 2-hour session each week. 2.5 credits. Dr. Willett, Mrs. Witschi, Dr. Hankinson. Reviews methods for assessing the dietary intake of populations and individuals. Students gain experience in the actual collection, analysis (including conversion to nutrients by computer), and interpretation of dietary intake. Case studies follow, involving specific diet/disease relationships integrating information from international studies, secular trends, clinical trials, analytical epidemiology, and animal experiments.
Course Note: BIO 200ab or BIO201ab, EPI 200a or EPI 201a required; signature of the instructor required for students who have not taken a course in nutrition.
F 10:30 - 12:20; Room 502, III

MCN 217d. Nutritional Surveillance (Department of Maternal and Child Health and the Department of Nutrition) (Course described under Maternal and Child Health.)

NUE 218ab. Advanced Nutritional Epidemiology (Department of Nutrition and the Department of Epidemiology)
Lectures, case studies. One two-hour section per week. 2.5 credits. Dr. Ascherio, Members of the Department. The course addresses methodological aspects of research in nutritional epidemiology. Topics include validation studies, adjustment for energy intake, and correction of measurement error. Theoretical as well as practical aspects will be covered. This course is intended primarily for students interested in doing epidemiological research.
Course Activities: Review of original articles, data analyses, computer simulations.
Course Note: BIO210cd or equivalent required; NUE 216cd required; signature of the instructor required indicating suitable background.
F 10:30 - 12:20; Room 206, III

NUT 300 a,b,c,d,e. Tutorial Programs
Time and credit to be arranged. Members of the Department. An opportunity for tutorial work is offered for interested and qualified students or small groups of students. Arrangements must be made with individual faculty members and are limited by the amount of faculty time available. These programs are open to all students who wish to go beyond the content of the regular courses. Tutorial work can include laboratory studies, projects in applied nutrition, library research, or the following special topic listed under NUT 301.
Course Note: Completed tutorial contract is required at the time of registration; maximum of 5 credits per tutorial topic; pass/fail only; course enrollment requires the signature of the instructor.
TBA

NUT 301 ab,cd. Nutrition/Health Promotion in the Mass Media
Time and credit to be arranged. Dr. Willett, Dr. Cheung. The role of the mass media in the promotion and adoption of healthy eating practices; extent and quality of coverage in various mass media outlets; creating messages for mass media use; effectiveness of existing mass communication campaigns in nutrition.
Course Note: NUT 201b or equivalent required; background in behavioral sciences or education recommened; completed tutorial contract required at time of registration; maximum of 5 credits per tutorial topic; pass/fail only; course enrollment requires the signature of the instructor indicating suitable background.
TBA

NUT 352-374 a,b,c,d,s. Research
Time and credit to be arranged. Members of the Department. For doctoral candidates who have passed their school-wide Oral Qualifying Examination and who are undertaking advanced work along the lines of fundamental or applied research in the department. Research topics that may be undertaken under the direction of the faculty are listed below.
Course Note: Pass/Fail only; maximum of 20 credits; course enrollment requires the signature of the instructor.
TBA

NUT 352. Dr. P. Goldman
The metabolism of food constituents and drugs, particularly as carried out by intestinal bacteria. Emphasis given to areas of metabolism that may help to understand a compound's biological activity.

NUT 358. Dr. Herrera-Acena
The role of nutrition and other environmental factors in the etiology and management of diabetes mellitus; the relationship of malnutrition to physical and cognitive development; Vitamin A deficiency and child morbidity and mortality.

NUT 363. Mrs. Witschi
Computer-based interactive dietary history, analysis, and counseling programs.

NUT 364. Dr. Reinhold
Structural characterization of glycoconjugates on biosurfaces by high performance liquid chromatography, gas chromatography, and mass spectrometry.

NUT 369. Dr. Sul
Regulation of lipogenic and glycolytic enzymes by hormonal and nutritional factors and alteration of this regulation in the diabetic state.

NUT 371. Dr. Peterson
Nutrition surveillance, epidemiology of malnutrition (including undernutrition, micronutrient deficiencies, and obesity) in industrialized and developing countries, methodological issues related to growth and nutrition status indicators, evaluation of community-based nutrition interventions.
Course Note: MCH 200a, NUT 210cd or MCN 207ab required; introductory epidemiology and biostatistics courses required; Doctoral candidates only; course enrollment is limited to 5 students; signature of the instructor required.

NUT 372. Dr. Frei
The roles of oxidants and antioxidants in the pathogenesis of atherosclerosis; assessment of oxidative stress in *in vivo*.

NUT 373. Dr. Wessling-Resnick
Regulation of the cellular uptake of macromolecular nutrients; iron transport mechanisms.

NUT 374. Dr. Willett
Nutritional epidemiology. Includes both the development and evaluation of questionnaire and biochemical methods to measure dietary intake in epidemiologic studies, and epidemiologic studies of nutritional factors in relation to risk of human diseases.

Population and International Health

PIH 191cd. Cities and Regions (Cross-listed as GSAS-Sociology 191)
Lectures. One 2-hour sessions each week. 5 credits. Dr. Alonso. Stresses the interaction of societies and their geographies, focusing primarily on historic and current developments in the United States. Considers demography, technology, institutions, ideology, health, the economy, and other factors.
TBA at GSAS

PIH 200a. Introduction to Population and International Health
Lectures. Two 2-hour sessions each week. 2.5 credits. Dr. Chen, Dr. Hill. This introductory course will review the basic dimensions of world population and health problems. The histories of the international population and public health movements are examined and contemporary demographic and epidemiologic conditions are reviewed. Four academic areas of departmental concentration are introduced: demography, reproductive health, international health policy and management, and international health epidemiology and ecology. The objectives of the course are to ensure that students are "literate" with regard to the major areas of interest in the Department, that they possess basic knowledge of history and contemporary situations, and that they are prepared for entry into more advanced subfields offered by the Department.
Course Note: This course is a departmental requirement in Population and International Health.
MW 10:30 - 12:20; Room G-1, III

PIH 210a. Health Policies in Developing Countries
Lectures. Two 2-hour sessions each week. 2.5 credits. Dr. Lucas. This course will provide an overview of major public health policies that have been developed in recent years that are shaping the reform of health services in developing countries. It will include an examination of concepts about the role of health in development as perceived by the World Health Organization, the World Bank, UNICEF, UNDP, and other multilateral and bilateral concepts. Topics to be discussed include "Health and Development," The Alma Mata Declaration, Primary Health Care and Selective Primary Health Care, quantitative approaches to the measurement of the burden of disease and their application in selecting health priorities, the role of communities in health, development including community financing of health care ("The Bamako Initiative"), the training and deployment of professional health personnel, and the role of research, specifically the modern concept of "Essential National Health Research" (ENHR). The course is designed to introduce students who have had little experience of work in developing countries to current topics of discussion and debate in the organization and management of health services in developing countries.
TR 1:30 - 3:20; Room 502, III

PIH 211b. Health Program Management in Developing Countries
Lectures, case studies. Two 2-hour sessions each week. 2.5 credits. Dr. Campbell. This course, intended for students who have not had previous formal training in management, has been designed to introduce topics which are critical to the successful administration of government and non-government health programs in developing countries. The subjects covered include strategic planning, social marketing, financial management, management information systems, and human resource management and program evaluation. Basic concepts and skills will be introduced. The instructor will primarily use the case method of teaching, drawing from situations in many types of organizations in multiple countries.
Course Note: PIH 210a or equivalent required; signature of the instructor required indicating suitable background.
TR 1:30 - 3:20; Room 502, III

PIH 212c. Socio-cultural Dimensions of International Health
Lectures. Two 2-hour sessions each week. 2.5 credits. Dr. Heggenhougen. Discusses the relevance of socio-cultural factors and elaborates the contributions of medical anthropology, its concepts and methods, to international public health. Demonstrates a socio-cultural conceptual framework analysis of health. Demonstrates how a health-seeking behavior, professional and public health education, and the challenges of specific tropical diseases may compliment epidemiological and biological models.
MW 3:30 - 5:20; Room 1110C, I

PIP 213d. Management Information Systems for Third World Health Systems (Department of Population and International Health and the Department of Health Policy and Management)
Lectures, case studies. Two 2-hour sessions each week. 2.5 credits. Dr. Reich, Dr. Lamstein. Explores the theoretical and practical concepts of information systems design. Begins with basic concepts of management, information theory, and systems analysis and proceeds to develop a general understanding of the design considerations of MIS. Focuses on both public and private sector systems and on the "human side" of MIS implementation. Emphasizes MIS development for use by third-world health sector managers.
MW 8:30 - 10:20; Room G-2, III

PIP 218c. Human Rights for Public Health Practitioners (Department of Population and International Health and the Department of Health Policy and Management)
Lectures, case studies. Two 2-hour sessions each week. 2.5 credits. Dr. Mann, Dr. Gostin, Dr. Lazzarini. Provides the basis for literacy on human rights, designed for public health practitioners. Places emphasis on the following: the universality of human rights; knowledge of international rights norms, institutions, and procedures; and application to public health work. Case studies are used to develop skills in responding to human rights issues in public health. Course concludes with practical workshops in application of course knowledge to public health work.
Course Note: Minimum enrollment of 10 student; signature of the instructor required.
TR 3:30 - 5:20; Room 213, III

PIH 220b. Introduction to Demographic Methods
Lectures. Two 2-hour sessions each week. 2.5 credits. Dr. Hill, Members of the Department. Reviews the main demographic approaches to the measurement of levels, trends and differentials in fertility, mortality, migration and population growth. Topics include basic formal demography, how the age distribution of a population is determined, period and cohort fertility, and mortality patterns and life tables. Model fertility and mortality schedules are explained.

Applications to contemporary and historical populations are illustrated. Prepares the student for more advanced work in demography including PIH 221c and PIH 222d.
MW 8:30 - 10:20; Room 1110C, I

PIH 221c. Analysis of Fertility and Proximate Determinants
Lectures, seminars. Two 2-hour sessions each week. 2.5 credits. Dr. Hill, and Members of the Department. Introduces models for the study of age patterns of fertility. Discusses the analysis of period and cohort trends with vital registration data and birth history material. Explores the concept of natural fertility and its biological and behavioral determinants. Explains the proximate determinants schema with examples of its application to the analysis of fertility and the estimation of the contribution of family planning programs to fertility change. Class exercises are required. Use of micro-computers is optional.
Course Activities: Class exercises optional; use of micro-computers.
Course Note: PIH 220b or equivalent required; signature of the instructor required indicating suitable background.
MW 1:30 - 3:20; Room 1110C, I

PIH 222d. Analysis of Mortality and Its Main Determinants
Seminars, lectures. Two 2-hour sessions each week. 2.5 credits. Dr. Hill, and Members of the Department. Explains how childhood mortality is measured when registration data are lacking. Shows how data from surveys and routinely collected health data may be used for mortality assessments. Includes a discussion of Brass techniques for childhood mortality estimation as well as life table methods from birth histories. Adult mortality is described using direct and indirect methods, including methods based on orphanhood and sibling survival, and adjusted age-specific death rates. Examines the main demographic causes of childhood and adult mortality differentials.
Course Activities: Class exercises optional; use of micro-computers.
Course Note: PIH 220b required; PIH 221c recommended.
MW 1:30 - 3:20; Room 1110C, I

[PIH 223ab.] Social Theories of Population Change
Not to be given 1993-94; offered alternate years. Lectures. Two 2-hour sessions each week. 5 credits. Dr. Chen, Dr. Mertens. To familiarize students with the major theories of population change and their implications for population programs and policies. Reviews major contributions and debates in the social sciences in regard to three major social transitions: the demographic (fertility, family and health transition), the rural urban (migration and urbanization), and the composition of labor force. Efforts are made to link elements of the various transitions within a framework which gives attention to culture, value systems, the structure of society, population systems, general development, and health and population policies. The course focuses on both historical experience and societies in the contemporary developing world.
Course Activities: Short papers; final paper.

PIH 227c. Anthropological Approaches to Demographic and Health Research
Lectures. Two 2-hour sessions each week. 2.5 credits. Dr. Obermeyer. This course uses the concepts and methods of anthropology to understand patterns of disease and reproduction in their cultural context. Through reading anthropological studies, students will acquire a broader perspective on the cultural context of health and fertility behavior, in particular reproduction, maternal health, and child health. They will learn about anthropological methods and the tools of research that are used to complement demography and epidemiology, including participant observation, focus groups, and rapid assessment procedures.
TR 1:30 - 3:20; Room 1110C, I

PIH 228d. The Demography of the Family
Lectures. Two 2-hour sessions each week. 2.5 credits. Dr. Hill, Dr. Das Gupta. This course reviews the theoretical and empirical contributions to the study of the family and the household as these relate to health and demographic outcomes. It will discuss the implications for health of different patterns of household formation; power relations between the sexes and between the old and the young; and the role of the household in coping mechanisms and informal insurance systems. These topics will be illustrated with studies drawn largely from societies in the historical experience of the West and from contemporary developing countries.
TR 1:30 - 3:20; Room; 1110C, I

PIH 231bc. Reproductive Health
Seminars. Two 2-hour sessions each week. 5 credits. Dr. Snow, Dr. Aitken. This course offers in-depth coverage of selected reproductive health problems of women and men particularly in non-industrialized countries. The selected topics may include complications of pregnancy and childbirth, low birth weight, reproductive tract infections, and subfecundity and the complications and side-effects of contraceptive technologies. For each topic, we will cover the global epidemiology, causal mechanisms and case management, and review the physiology and pathophysiology as required for comprehensive understanding of causality and treatment. The emphasis will be on active individual and group learning through study groups, tutorials, and occasional lectures.
Course Note: Students without prior training in human physiology or medicine are welcome, but are encouraged to seek the guidance of the instructors before "b" period begins for appropriate preparation; registration in both semesters required; students receive grade only after "c" period; course enrollment is limited to 16 students; signature of the instructor required.
"b" period
TR 10:30 - 12:20; Room 1110C, I
"c" period
TR 10:30 - 12:20; Room 1110C, I

PIH 232d. Design and Implementation of Reproductive Health Programs in Developing Countries
Lectures. Two 2-hour sessions each week. 2.5 credits. Dr. Aitken, Dr. Kaufman. This course examines the different issues involved in the design and implementation of health care services for family planning, maternal and perinatal care, and maternal nutrition and the control of sexually transmitted diseases in developing countries. It then evaluates the evidence for improvements in quality care, program effectiveness achieved through different approaches at integration of these services.
Course Note: PIH 231bc; or signature of the instructor required.
MW 10:30 - 12:20; Room 1110C, I

[PIH 236b.] Research Seminar in Reproductive Health
Not to be given 1993-94; offered alternate years. Seminars. One 2-hour session each week. 2.5 credits. Dr. Snow, Members of the Department. This course includes seminars and discussion of selected topics in reproductive health and the relevant current literature. Topics will change on a yearly basis. Seminars are directed to second year students in reproductive health or students with prior experience in the topic currently being offered.
Course Note: PIH 231bc or signature of the instructor required.

PIH 237cd. Biological Basis for Fertility Control
Lectures. Two 2.5-hour sessions each week. 5 credits. Dr. Salhanick. The course is divided into essentially four parts: fundamental principles of contraception and structure-activity relationships of contra-

ceptive and contragestational steroids; their actions, metabolism and side effects and the biological mechanisms for these actions and effects; regulation of the menstrual cycle and its application to fertility control; and selected aspects of reproductive biology which may apply to the development of future contraceptives or contragestational agents.
Course Activities: A short paper and/or presentation may be required.
Course Note: Appropriate science background; signature of the instructor required.
MW 1:00 - 3:20; Room 209, III

PIP 240d. Political Economy of International Health Policy (Department of Population and International Health and the Department of Health Policy and Management)
Lectures, seminars, case studies. Two 2-hour sessions each week. 2.5 credits. Dr. Reich. Examines issues of health and development in the context of international politics and economics. Explores how relations between developed and developing countries affect the formulation and implementation of health policy and the impact of development policy on health. Students are introduced to two contrasting perspectives on health and development: modernization theory and dependency theory, with attention to the roles of states, markets, and international institutions.
Course Activities: Case studies are used to illustrate constraints and opportunities for influencing health and development policies.
TR 10:30 - 12:20; Room 201, III

PIH 241c. Health Planning in Developing Countries: Cost-Effective Analysis and Priority Setting Techniques
Lectures. Two 2-hour sessions each week. 2.5 credits. Dr. Murray, Dr. Chen. Through the use of lectures, problem sets and case studies, students will learn the applied skills needed for the evaluation of health projects, interventions and programs. Emphasis will be placed on cost-effectiveness information.
Course Activities: The class will be divided into groups; and will use these skills on health priority setting exercises for specific countries to give group presentations.
TR 10:30 - 12:20; Room 202, III

[PIH 242cd.] The Household Production of Health in Developing Countries
Not to be given 1993-94; offered alternate years. Lectures. One 2-hour session each week. 2.5 credits. Dr. Berman. Household economic, social, and behavioral factors are significant determinants of health status and health program performance in developing countries. This course presents a multi-disciplinary social science framework, emphasizing household economics, for analyzing household factors in health. Students will be exposed to household production, consumption and reproduction, and social relations functions, and their linkages to health through micro-economic models of household behavior as applied in developing countries.
Course Note: Basic understanding of concepts and methods of microeconomics required, preferably completion of an introductory course.

PIH 244ab. Population Policies
To be given 1993-94; offered alternate years. Lectures. Two 2-hour sessions each week. 5 credits. Dr. Mertens, Dr. Chen. The course, grounded in the awareness that population policies are an important part of modern social and economic welfare policies, will review population policies which have been designed to impact directly on human reproduction, demographic aspects of health and mortality, migration, urbanization and settlement patterns. The course will also look at other social and economic policies directed to problems which are in some way related to or caused by population dynamics.
MW 3:30 - 5:20; Room 1110C, I

PIH 246cd. Doctoral Seminar in International Health Policy and Economics
Seminar. One 2-hour session every other week. 1.25 credits. Dr. Berman, Dr. Reich, Dr. Murray, Dr. Hsiao. This seminar will explore in depth a selection of important international health policy and economics research topics to be determined by the faculty participants. The emphasis will be a detailed discussion on theoretical frameworks, analytical techniques, empirical applications, and technical results to better understand how key policy and economics research issues are defined and how studies carried out and applied.
Course Activities: Students will write a paper on a topic mutually agreed upon with the instructors.
Course Note: Student participation is restricted to those already in a doctoral program or equivalent advanced study program related to international health policy and economics;
course taught alternate weeks.
T 4:00 - 6:00; TBA

PIT 250b. Epidemiology of Infectious Diseases of Public Health Importance in Developing Countries (Department of Population and International Health and the Department of Tropical Public Health)
Lectures, case studies. Two 2-hour sessions each week. 2.5 credits. Dr. Cash, Guest Lecturers. This course thoroughly reviews the epidemiology of infectious diseases of public health importance in developing countries. Emphasizes epidemiologic patterns of bacterial and viral diseases as they relate to different geographic and socioeconomic environments. Stresses methods of disease surveillance, especially with regard to prevention and control.
Course Activities: Case studies are extensively used with student teams proposing solutions to the problems.
MW 1:30 - 3:20; Room G-2, III

PIH 253d. Human Ecology
Lectures. Two 2-hour sessions each week. 2.5 credits. Dr. Levins. Provides a broad overview of the human ecosystem as it emerges out of, but is different from, pre-human ecology. Topics are selected from biosphere processes, population interaction, agricultural systems, adaptation evolution and ecology of disease, ecological politics, and evolution. Also considers the role of knowledge and conscious planning as an aspect of human ecology and examines the approaches toward the solution of ecological problems.
Course Note: Basic knowledge of biology required; signature of the instructor required indicating suitable background.
TR 10:30 - 12:20; Room 212, III

PIH 254c. Longitudinal Community-Based Studies of Health
Lectures, case studies. Two 2-hour sessions each week. 2.5 credits. Dr. Hill, Members of the Department. Illustrates and analyzes the population-based community approach to understanding the health problems of a community. Applies basic principles of epidemiology, demography, and biological, social, and behavioral ecology at the community level. Participants learn how the basic determinants of community-based measurements of risks of sickness, death, birth, and migration form the foundation for setting priorities for health programs appropriate to the community. Provides a strategy to practice community health, to document the impact of programs, and to involve the community in these processes. Reviews and analyzes classic population-based community studies in depth.
TR 10:30 - 12:20; Room 201, III

PIE 255c. AIDS: Responding to a Global Epidemic (Department of Population and International Health and the Department of Epidemiology)
Two 2-hour sessions each week. 2.5 credits. Dr. Mann. This course presents a global perspective on HIV/AIDS pandemic with emphasis on design and implementation of global AIDS strategy and WHO Global Program. Topics include: discovery and recognition of AIDS pandemic; development of global strategy; mobilization of opinion, resources, and institutions; national AIDS program, development assistance and international cooperation; global policy articulation; and human rights. It concludes with an assessment of current status and key issues for AIDS and global health in the 1990's.
TR 8:30 - 10:20; Room 502, III

PIH 260cd. Student Project Design Seminar
Lectures, seminars. One 2-hour session each week. 2.5 credits. Dr. Levins. This course is oriented toward health and population problems of communities. Each student selects a community and an appropriate health or population problem. Each student presents a critical survey of the relevant literature and a project design. The objectives are to understand the selected problem in its broader context and inner structure, to examine the processes of learning more about it and acting on it, and to turn general insights into a workable plan.
Course Note: PIH 254c required; introductory courses in biostatistics and epidemiology required; interview with the instructor required; course enrollment is limited to 8 students; signature of the instructor required.
W 10:30 - 12:20; Room 209, III

PIH 263e. Government and Private Funding for Research and Health Care
Lectures, seminars. Five 3-hour sessions for one week. 1 credit. Dr. Cash, Dr. Dumbaugh. This one-week seminar was developed in response to a need of students at the Harvard School of Public Health who will be seeking funding for international or domestic research and health services programs for which they are now responsible or will be responsible upon graduation. The object of the seminar is to provide participants with: the opportunity to prepare a fundable grant proposal for submission to a funding agency upon completion of the course; a framework which enables participants to write realistic and fundable proposals for basic or applied research, or for projects which deliver services or care; and numerous sources of information about organizations which fund such work.
TBA

PIH 300 a,b,c,d,s. Tutorial Programs
Time and credit to be arranged. Members of the Department. An opportunity for tutorial work is offered for interested and qualified students or small groups of students. Arrangements must be made with individual faculty members and are limited by the amount of faculty time available. These programs are open to all students who wish to go beyond the content of the regular courses. The program provides an opportunity to consider the design of studies, programs, or analysis of data.
Course Note: Completed tutorial contract is required at the time of registration; maximum of 5 credits per tutorial topic; pass/fail only; course enrollment requires the signature of the instructor.
TBA

PIH 350-356 a,b,c,d,s. Research
Time and credit to be arranged. Members of the Department, Members of the Center for Population Studies. For doctoral candidates who have passed their school-wide Oral Qualifying Examination and who are undertaking advanced work along the lines of fundamental or applied research in the department.
Course Note: Pass/Fail only; maximum of 20 credits; course enrollment requires the signature of the instructor.
TBA

PIH 351. Biomedicine and Reproductive Physiology
Dr. Salhanick

PIH 353. Population Ethics
Dr. Dyck

PIH 355. Complex Systems
Dr. Levins

PIH 356. Biostatistics for International Health
Dr. Wyshak

Tropical Public Health

TPH 201a. Ecology, Epidemiology, and Control of Important Parasitic Diseases of Developing Areas
Lectures, seminars, demonstrations. Two 1-hour sessions and one 2-hour session each week. 3 credits. Dr. Maguire, Members of the Department, Guest Lecturers. Provides an introduction to ecological and epidemiologic concepts basic to the control of infectious agents. Considers important parasitic diseases of particular significance in the developing areas of the world. Epidemiologic principles of vector-associated diseases are elucidated through study of entities such as malaria and schistosomiasis.
Course Note: Background in biology required; knowledge of pathogenesis of infectious diseases desirable; signature of the instructor required indicating suitable background.
MWF 3:30 - 5:20; Room 213, III

TPH 203b. Mycobacterioses
Lectures. One 2-hour session each week. 1.25 credits. Dr. Piessens, Guest Lecturers. Covers the immunobiology of mycobacteria and worldwide epidemiology, clinical diagnosis, and treatment of tuberculosis, leprosy, and diseases caused by other mycobacteria. Also deals with laboratory diagnosis, BCG vaccination, chemoprophylaxis, prevention, and tuberculosis control in Massachusetts, the U.S., and other countries.
Course Note: Minimum enrollment of 6 students required; signature of the instructor required.
F 1:30 - 3:20; Room 202, III

TPH 204c. Introduction to the Techniques of Investigation of Parasitic Infections
Lectures, laboratories. Two 3-hour sessions and one 2-hour session each week. 5 credits. Dr. Maguire, Dr. Telford. Emphasizes basic laboratory methods for the study of parasitic diseases of public health importance. Provides exposure to theory and application of techniques essential to epidemiologic and laboratory investigation. Life cycles of several parasites are maintained and examined with respect to detection and quantification of infection, immunity, and control.
Course Note: Background in biology required; course enrollment is limited to 15 students; signature of the instructor required indicating suitable background.
M 1:30 - 3:20; Room 512, I
WF 1:30 - 4:20; Room 512, I

TPH 205c. Clinical and Pathologic Features of Tropical Diseases
Lectures, case presentations, clinico-pathologic conferences, demonstrations. One 2-hour session each week. 1.25 credits. Dr. Maguire, Dr. von Lichtenberg (HMS), Members of the Department, Members of the Pathology Department (HMS). Designed for students particularly interested in tropical medicine. Emphasizes the clinico-pathologic aspects of tropical diseases. At each session, disease entities are introduced by presenting a clinical case, and pertinent clinical and pathologic features of the disease are then reviewed.
Course Note: Knowledge of pathogenesis of infectious diseases desirable; signature of the instructor required indicating suitable background.
T 8:30 - 10:20; Room 409, II

TPH 206d. Principles of Public Health Entomology
Lectures, laboratories, seminars, field trips. One 3-hour session each week. 2.5 credits. Dr. Spielman. The manner in which arthropods transmit disease and the principles of vector control are discussed from ecological, physiological, and genetic points of view. Class sessions introduce concepts and techniques currently employed in controlling vector-borne disease. Weekend field trips provide an opportunity for students to apply skills acquired in the classroom.
Course Note: TPH 201a or signature of the instructor required indicating suitable biology background.
F 1:30 - 4:50; Room 409, II

[TPH 208cd.] Immunology of Parasitic Infection (Cross-listed as HMS-IM724.0)
Not to be given 1993-94; offered alternate years. Lectures, discussions. One 3-hour session each week. 5 credits. Dr. Titus, Dr. Harn, Members of the Department, Guest Lecturers. Covers aspects of immune evasion, cell-mediated and humoral aspects of protective immunity, and immunopathology in various protozoan helminth parasites of humans. Includes discussions of antigenic variation, molecular mimicry, resistance to immune mechanisms, development of protective or antipathology vaccines relevant to malaria, schistosomes, filariae, leishmania, amoeba, and trypanosomes.
Course Activities: Each session requires reading several papers and writing answers to problem sets.
Course Note: Course in immunology; course enrollment is limited to 35 students; signature of the instructor required.

TPH 216cd. Cellular and Molecular Biology of Parasites (Cross-listed as GSAS-IMM214a and IMM214b and HMS-IM721.0)
Not to be given 1994-95; offered alternate years. Lectures, discussions. One 3-hour session each week. 5 credits. Dr. Harn, Dr. Titus, Members of the Department, Guest Lecturers. Covers aspects of cell, developmental, and molecular biology of various protozoan and helminth parasites of humans. Includes discussion on novel membrane structures, mechanisms by which drug development occurs, vector biology, and the molecular basis for antigenic variation and immune evasion of malaria, schistosomes, filariae, leishmania, amoeba, and trypanosomes.
Course Activities: Each session requires reading several papers and writing answers to problem sets.
Course Note: Suitable course in cell/molecular biology, biochemistry, or developmental biology required; course enrollment is limited to 35 students; signature of the instructor required indicating suitable background.
T 3:30 - 6:20; Room 502, III

PIT 250b. Epidemiology of Infectious Diseases of Public Health Importance in Developing Countries (Department of Population and International Health and the Department of Tropical Public Health) (Course described under Population and International Health)

TPH 300 a,b,c,d,e,s. Tutorial Programs
Laboratory exercises. Time and credit to be arranged. Members of the Department. An opportunity for tutorial work is offered for interested and qualified students or small groups of students. Arrangements must be made with individual faculty members and are limited by the amount of faculty time available. These programs are open to all students who wish to go beyond the content of the regular courses. Various parasites of medical importance are maintained and are available for studies on immunology, molecular biology, cell biology, biochemistry, and chemotherapy.
Course Note: Completed tutorial contract is required at the time of registration; maximum of 5 credits per tutorial topic; pass/fail only; course enrollment requires the signature of the instructor.
TBA

TPH 340 a,b,c,d. Seminar on the Molecular Epidemiology of Infectious Diseases
One l-hour session each week. Credits to be arranged. Dr. Maguire, Dr. Wirth. Each session will consist of a presentation of an epidemiological study of an infectious disease using modern molecular biological tools.
Course Activities: Students will be required to design projects, make oral presentations to the class, and participate in group discussions.
Course Note: Pass/fail only; course enrollment requires the signature of the instructor.
"a" period
T 12:30 - 1:20; Room 409, II

TPH 350 a,b,c,d,s. Research
Time and credit to be arranged. Members of the Department. For doctoral candidates who have passed their school-wide Oral Qualifying Examination and who are undertaking advanced work along the lines of fundamental or applied research in the department.
Course Note: Pass/Fail only; maximum of 20 credits; course enrollment requires the signature of the instructor.
TBA

Biology, host-parasite relationships, and control of protozoa and helminths

Population genetics, nutrition, and reproduction of medically-imported arthropods

Immunology of protozoa and helminths

Molecular biology of protoaoz and helminths

Anthropod transmission of bacterial, viral, protozoan, and helminthic agents

Epidemiology/clinical studies
See also PIH-TPH 250b, ID 201cd and ID 223cd

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Tamara Karn Hareven, AB (Hebrew University), AM (University of Cincinnati), PhD (Ohio State University); Adjunct Professor of Population Studies (Population and International Health); Unidel Professor of Family Studies and History, University of Delaware.

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Joseph John Harrington, BCE (Manhattan College), AM, PhD (Harvard University); Professor of Environmental Health Engineering (Environmental Health and Population and International Health); Gordon McKay Professor of Environmental Engineering in the Faculty of Arts and Sciences.

William Alan Haseltine, AB (University of California, Berkeley), PhD (Harvard University); Professor in the Department of Cancer Biology; Professor of Pathology, Harvard Medical School.

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Richard Charles Lewontin, AB (Harvard University), AM, PhD (Columbia University); Member of the Faculty of Public Health (Population and International Health); Alexander Agassiz Professor of Zoology, Faculty of Arts and Sciences.

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Milton Charles Weinstein, AB, AM, MPP, PhD (Harvard University); Henry J. Kaiser Professor of Health Policy and Management (Health Policy and Management and Biostatistics) (on leave 1993-94).

Marianne Wessling-Resnick, BS (Worcester Polytechnic Institute), MS (University of Chicago), PhD (University of Massachusetts Medical School); Assistant Professor of Nutrition.

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Professors Emeriti

Harry Nicholas Antoniades, BS, PhD; AM (hon.); Professor of Biochemistry, Emeritus (1993).

David Elliott Bell, AB, AM; LLD (hon.); Clarence James Gamble Professor of Population Sciences and International Health, Emeritus (1988).

William Alfred Burgess, SB, SM; Associate Professor of Occupational Health Engineering, Emeritus (1992).

John Cairns, MD, BA, BM, BCh, DM; AM (hon.); Professor of Microbiology, Emeritus (1992).

William John Curran, JD, LLM, SM in Hyg; LLD (hon.); Frances Glessner Lee Professor of Legal Medicine in the Faculty of Medicine and the Faculty of Public Health, Emeritus (1991).

Paul Maximillian Densen, AB, SD; AM (hon.); Professor of Community Health, Emeritus (1980).

Benjamin Greeley Ferris, Jr., AB, MD; DHC (hon.); Professor of Environmental Health and Safety, Emeritus (1989).

Melvin William First, SB, SM, SD; Professor of Environmental Health Engineering, Emeritus (1985).

Rose Epstein Frisch, AB, AM, PhD; Associate Professor of Population Studies, Emerita (1992).

Robert Pershing Geyer, SB, SM, PhD; Professor of Nutrition, Emeritus (1987).

Roy Orval Greep, SB, SM, PhD; AM, SD (hon.); John Rock Professor of Population Sciences, Emeritus (1974).

David Mark Hegsted, SB, SM, PhD; AM (hon.); Professor of Nutrition, Emeritus (1980).

Donald Frederick Hornig, SB, PhD; LLD, DHL, LLD, ScD, ScD, ScD, LLD, ScD, DEng, DSc, ScD, ScD, ScD, LLD, DSc, ScD (hon.); Professor of Chemistry in Public Health, Emeritus (1990).

George Barkley Hutchison, AB, MD, MPH; Professor of Epidemiology, Emeritus (1988).

Nathan Keyfitz, BSc, PhD; Andelot Professor of Sociology in the Faculty of Arts and Sciences and of Demography in the Faculty of Public Health, Emeritus (1983).

Alexander Hamilton Leighton, AB, AM, MD; AM (hon.); Professor of Social Psychiatry, Emeritus (1975).

Bernard Lown, SB, MD; AM, SD, SD, LHD (hon.); Professor of Cardiology in Nutrition, Emeritus (1991).

Brian MacMahon, MB, ChB, MD, DPH, PhD, SM; MD, DSc (hon.); Henry Pickering Walcott Professor of Epidemiology, Emeritus (1989).

Jere Mead, SB, MD; Cecil K. and Philip Drinker Professor of Environmental Physiology, Emeritus (1987).

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Steve Chia-Tung Pan, BS, MD, MPH; Professor of Tropical Public Health, Emeritus (1992).

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